```
        10          20          30          40          50          60
CATCATCAAT AATCTACAGT ACACTGATGG CAGCGGTCCA ACTGCCAATC ATTTTTGCCA

        70          80          90         100         110         120
CGTCATTTAT GACGCAACGA CGGCGAGCGT GGCGTGCTGA CGTAACTGTG GGGCGGAGCG

       130         140         150         160         170         180
CGTCGCGGAG GCGGCGGCGC TGGGCGGGGC TGAGGGCGGC GGGGGCGGCG CGCGGGGCGG

       190         200         210         220         230         240
CGCGCGGGGC GGGGCGAGGG GCGGAGTTCC GCACCCGCTA CGTCATTTTC AGACATTTTT

       250         260         270         280         290         300
TAGCAAATTT GCGCCTTTTG CAAGCATTTT TCTCACATTT CAGGTATTTA GAGGGCGGAT

       310         320         330         340         350         360
TTTTGGTGTT CGTACTTCCG TGTCACATAG TTCACTGTCA ATCTTCATTA CGGCTTAGAC

       370         380         390         400         410         420
AAATTTTCGG CGTCTTTTCC GGGTTTATGT CCCCGGTCAC CTTTATGACT GTGTGAAACA

       430         440         450         460         470         480
CACCTGCCCA TTGTTTACCC TTGGTCAGTT TTTTCGTCTC CTAGGGTGGG AACATCAAGA
```

FIG. IA

Title RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors Suresh K. MITTAL et al
Application No 10/046,938
Docket No.: 293102002103

Sheet 1 of 50

```
       490         500         510         520         530         540
ACAAATTTGC CGAGTAATTG TGCACCTTTT TCCGCGTTAG GACTGCGTTT CACACGTAGA

       550         560         570         580         590         600
CAGACTTTTT CTCATTTTCT CACACTCCGT CGTCCGCTTC AGAGCTCTGC GTCTTCGCTG

         610         620         630         640         650
CCACC ATG AAG TAC CTG GTC CTC GTT CTC AAC GAC GGC ATG AGT CGA ATT GAA
      Met Lys Tyr Leu Val Leu Val Leu Asn Asp Gly Met Ser Arg Ile Glu

       660         670         680         690         700
AAA GCT CTC CTG TGC AGC GAT GGT GAG GTG GAT TTA GAG TGT CAT GAG GTA
Lys Ala Leu Leu Cys Ser Asp Gly Glu Val Asp Leu Glu Cys His Glu Val

     710         720         730         740         750
CTT CCC CCT TCT CCC GCG CCT GTC CCC GCT TCT GTG TCA CCC GTG AGG AGT
Leu Pro Pro Ser Pro Ala Pro Val Pro Ala Ser Val Ser Pro Val Arg Ser

   760         770         780         790         800
CCT CCT CCT CTG TCT CCG GTG TTT CCT CCG TCT CCG CCA GCC CCG CTT GTG
Pro Pro Pro Leu Ser Pro Val Phe Pro Pro Ser Pro Pro Ala Pro Leu Val

  810         820         830         840         850
AAT CCA GAG GCG AGT TCG CTG CTG CAG CAG TAT CGG AGA GAG CTG TTA GAG
Asn Pro Glu Ala Ser Ser Leu Leu Gln Gln Tyr Arg Arg Glu Leu Leu Glu
```

FIG. 1B

```
860           870           880           890           900
AGG AGC CTG CTC CGA ACG GCC GAA GGT CAG CAG CGT GCA GTG TGT CCA TGT
Arg Ser Leu Leu Arg Thr Ala Glu Gly Gln Gln Arg Ala Val Cys Pro Cys

910           920           930           940           950
GAG CGG TTG CCC GTG GAA GAG GAT GAG TGT CTG AAT GCC GTA AAT TTG CTG
Glu Arg Leu Pro Val Glu Glu Asp Glu Cys Leu Asn Ala Val Asn Leu Leu

960           970           980           990          1000          1010
TTT CCT GAT CCC TGG CTA AAT GCA GCT GAA AAT GGG GGT GAT ATT TTT AAG
Phe Pro Asp Pro Trp Leu Asn Ala Ala Glu Asn Gly Gly Asp Ile Phe Lys

         1020          1030          1040          1050          1060
TCT CCG GCT ATG TCT CCA GAA CCG TGG ATA GAT TTG TCT AGC TAC GAT AGC
Ser Pro Ala Met Ser Pro Glu Pro Trp Ile Asp Leu Ser Ser Tyr Asp Ser

       1070          1080          1090          1100          1110
GAT GTA GAA GAG GTG ACT AGT CAC TTT TTT CTG GAT TGC CCT GAA GAC CCC
Asp Val Glu Glu Val Thr Ser His Phe Phe Leu Asp Cys Pro Glu Asp Pro

      1120          1130          1140          1150          1160
AGT CGG GAG TGT TCA TCT TGT GGG TTT CAT CAG GCT CAA AGC GGA ATT CCA
Ser Arg Glu Cys Ser Ser Cys Gly Phe His Gln Ala Gln Ser Gly Ile Pro
```

FIG. IC

```
     1170         1180         1190         1200         1210
GGC ATT ATG TGC AGT TTG TGC TAC ATG CGC CAA ACC TAC CAT TGC ATC TAT
Gly Ile Met Cys Ser Leu Cys Tyr Met Arg Gln Thr Tyr His Cys Ile Tyr

   1220       1230       1240       1250       1260       1270
A[GTAAG TACATTCTGT AAAAGAACAT CTTGGTGATT TCTAGGTATT GTTTAGGGAT
S

      1280       1290       1300       1310       1320          1330
TAACTGGGTG GAGTGATCTT AATCCGGCAT AACCAAATAC ATGTTTTCAC AG]GT CCA GTT
                                                       er Pro Val

         1340       1350       1360       1370       1380       1390
TCT GAA GAG GAA ATG TGAGT CATGTTGACT TTGGCGCGC A AGAGGAAATG TGAGTCATGT
Ser Glu Glu Glu Met End

      1400       1410       1420       1430       1440       1450
TGACTTTGGC GCGCCCTACG GTGACTTTAA AGCAATTTGA GGATCACTTT TTTGTTAGTC

      1460       1470         1480         1490         1500
GCTATAAAGT AGTCACGGAG TCTTC ATG GAT CAC TTA AGC GTT CTT TTG GAT TTG
                           Met Asp His Leu Ser Val Leu Leu Asp Leu

  1510         1520         1530         1540         1550
AAG CTG CTT CGC TCT ATC GTA GCG GGG GCT TCA AAT CGC ACT GGA GTG TGG
Lys Leu Leu Arg Ser Ile Val Ala Gly Ala Ser Asn Arg Thr Gly Val Trp
```

FIG. 1D

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: [redacted]esh K. MITTAL et al
Application No.: 10/046,938
Docket No.: 293102002103

```
 1560         1570         1580         1590         1600
AAG AGG CGG CTG TGG CTG GGA CGC CTG ACT CAA CTG GTC CAT GAT ACC TGC
Lys Arg Arg Leu Trp Leu Gly Arg Leu Thr Gln Leu Val His Asp Thr Cys

1610         1620         1630         1640         1650
GTA GAG AAC GAG AGC ATA TTT CTC AAT TCT CTG CCA GGG AAT GAA GCT TTT
Val Glu Asn Glu Ser Ile Phe Leu Asn Ser Leu Pro Gly Asn Glu Ala Phe

1660         1670         1680         1690         1700
TTA AGG TTG CTT CGG AGC GGC TAT TTT GAA GTG TTT GAC GTG TTT GTG GTG
Leu Arg Leu Leu Arg Ser Gly Tyr Phe Glu Val Phe Asp Val Phe Val Val

1710         1720         1730         1740         1750         1760
CCT GAG CTG CAT CTG GAC ACT CCG GGT CGA GTG GTC GCC GCT CTT GCT CTG
Pro Glu Leu His Leu Asp Thr Pro Gly Arg Val Val Ala Ala Leu Ala Leu

         1770         1780         1790         1800         1810
CTG GTG TTC ATC CTC AAC GAT TTA GAC GCT AAT TCT GCT TCT TCA GGC TTT
Leu Val Phe Ile Leu Asn Asp Leu Asp Ala Asn Ser Ala Ser Ser Gly Phe

       1820         1830         1840         1850         1860
GAT TCA GGT TTT CTC GTG GAC CGT CTC TGC GTG CCG CTA TGG CTG AAG GCC
Asp Ser Gly Phe Leu Val Asp Arg Leu Cys Val Pro Leu Trp Leu Lys Ala
                                                  Met Ala Glu Gly
```

FIG. 1E

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventor: [redacted] K. MITTAL et al
Application No.: 10/046,938
Docket No.: 293102002103

1870 1880 1890 1900 1910
AGG GCG TTC AAG ATC ACC CAG AGC TCC AGG AGC ACT TCG CAG CCT TCC TCG
Arg Ala Phe Lys Ile Thr Gln Ser Ser Arg Ser Thr Ser Gln Pro Ser Ser
Gln Gly Val Gln Asp His Pro Glu Leu Gln Glu His Phe Ala Ala Phe Leu

1920 1930 1940 1950 1960
TCG CCC GAC AAG ACG ACC CAG ACT ACC AGC CAG TA GAC GGG GAC AGC CCA
Ser Pro Asp Lys Thr Thr Gln Thr Thr Ser Gln End
Val Ala Arg Gln Asp Asp Pro Asp Tyr Gln Pro Val Asp Gly Asp Ser Pro

1970 1980 1990 2000 2010
CCC CGG GCT AGC CTG GAG GAG GCT GAA CAG AGC AGC ACT CGT TTC GAG CAC
Pro Arg Ala Ser Leu Glu Glu Ala Glu Gln Ser Ser Thr Arg Phe Glu His

2020 2030 2040 2050 2060
ATC AGT TAC CGA GAC GTG GTG GAT GAC TTC AAT AGA TGC CAT GAT GTT TTT
Ile Ser Tyr Arg Asp Val Val Asp Asp Phe Asn Arg Cys His Asp Val Phe

2070 2080 2090 2100 2110
TAT GAG AGG TAC AGT TTT GAG GAC ATA AAG AGC TAC GAG GCT TTG CCT GAG
Tyr Glu Arg Tyr Ser Phe Glu Asp Ile Lys Ser Tyr Glu Ala Leu Pro Glu

FIG. IF

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: Suresh K. MITTAL et al
Application No.: 10/046,938
Docket No.: 29310200210

```
 2120         2130         2140         2150         2160
GAC AAT TTG GAG CAG CTC ATA GCT ATG CAT GCT AAA ATC AAG CTG CTG CCC
Asp Asn Leu Glu Gln Leu Ile Ala Met His Ala Lys Ile Lys Leu Leu Pro

2170         2180         2190         2200         2210
GGT CGG GAG TAT GAG TTG ACT CAA CCT TTG AAC ATA ACA TCT TGC GCC TAT
Gly Arg Glu Tyr Glu Leu Thr Gln Pro Leu Asn Ile Thr Ser Cys Ala Tyr

2220         2230         2240         2250         2260
GTG CTC GGA AAT GGG GCT ACT ATT AGG GTA ACA GGG GAA GCC TCC CCG GCT
Val Leu Gly Asn Gly Ala Thr Ile Arg Val Thr Gly Glu Ala Ser Pro Ala

2270         2280         2290         2300         2310         2320
ATT AGA GTG GGG GCC ATG GCC GTG GGT CCG TGT GTA ACA GGA ATG ACT GGG
Ile Arg Val Gly Ala Met Ala Val Gly Pro Cys Val Thr Gly Met Thr Gly

          2330         2340         2350         2360         2370
GTG ACT TTT GTG AAT TGT AGG TTT GAG AGA GAG TCA ACA ATT AGG GGG TCC
Val Thr Phe Val Asn Cys Arg Phe Glu Arg Glu Ser Thr Ile Arg Gly Ser

        2380         2390         2400         2410         2420
CTG ATA CGA GCT TCA ACT CAC GTG CTG TTT CAT GGC TGT TAT TTT ATG GGA
Leu Ile Arg Ala Ser Thr His Val Leu Phe His Gly Cys Tyr Phe Met Gly
```

FIG. 1G

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: [redacted]esh K. MITTAL et al
Application No.: 10/046,938
Docket No.: 293102002103

```
      2430          2440          2450          2460          2470
ATT ATG GGC ACT TGT ATT GAG GTG GGG GCG GGA GCT TAC ATT CGG GGT TGT
Ile Met Gly Thr Cys Ile Glu Val Gly Ala Gly Ala Tyr Ile Arg Gly Cys

     2480          2490          2500          2510          2520
GAG TTT GTG GGC TGT TAC CGG GGA ATC TGT TCT ACT TCT AAC AGA GAT ATT
Glu Phe Val Gly Cys Tyr Arg Gly Ile Cys Ser Thr Ser Asn Arg Asp Ile

   2530          2540          2550          2560          2570
AAG GTG AGG CAG TGC AAC TTT GAC AAA TGC TTA CTG GGT ATT ACT TGT AAG
Lys Val Arg Gln Cys Asn Phe Asp Lys Cys Leu Leu Gly Ile Thr Cys Lys

  2580          2590          2600          2610          2620
GGG GAC TAT CGT CTT TCG GGA AAT GTG TGT TCT GAG ACT TTC TGC TTT GCT
Gly Asp Tyr Arg Leu Ser Gly Asn Val Cys Ser Glu Thr Phe Cys Phe Ala

 2630          2640          2650          2660          2670
CAT TTA GAG GGA GAG GGT TTG GTT AAA AAC AAC ACA GTC AAG TCC CCT AGT
His Leu Glu Gly Glu Gly Leu Val Lys Asn Asn Thr Val Lys Ser Pro Ser

2680          2690          2700          2710          2720
CGC TGG ACC AGC GAG TCT GGC TTT TCC ATG ATA ACT TGT GCA GAC GGC AGG
Arg Trp Thr Ser Glu Ser Gly Phe Ser Met Ile Thr Cys Ala Asp Gly Arg
```

FIG. 1H

```
2730          2740          2750          2760          2770
  GTT ACG CCT TTG GGT TCC CTC CAC ATT GTG GGC AAC CGT TGT AGG CGT TGG
  Val Thr Pro Leu Gly Ser Leu His Ile Val Gly Asn Arg Cys Arg Arg Trp

2780          2790          2800          2810          2820          2830
  CCA ACC ATG CAG GGG AAT GTG TTT ATC ATG TCT AAA CTG TAT CTG GGC AAC
  Pro Thr Met Gln Gly Asn Val Phe Ile Met Ser Lys Leu Tyr Leu Gly Asn

          2840          2850          2860          2870          2880
  AGA ATA GGG ACT GTA GCC CTG CCC CAG TGT GCT TTC TAC AAG TCC AGC ATT
  Arg Ile Gly Thr Val Ala Leu Pro Gln Cys Ala Phe Tyr Lys Ser Ser Ile

        2890          2900          2910          2920          2930
  TGT TTG GAG GAG AGG GCG ACA AAC AAG CTG GTC TTG GCT TGT GCT TTT GAG
  Cys Leu Glu Glu Arg Ala Thr Asn Lys Leu Val Leu Ala Cys Ala Phe Glu

       2940          2950          2960          2970          2980
  AAT AAT GTA CTG GTG TAC AAA GTG CTG AGA CGG GAG AGT CCC TCA ACC GTG
  Asn Asn Val Leu Val Tyr Lys Val Leu Arg Arg Glu Ser Pro Ser Thr Val

     2990          3000          3010          3020          3030
  AAA ATG TGT GTT TGT GGG ACT TCT CAT TAT GCA AAG CCT TTG ACA CTG GCA
  Lys Met Cys Val Cys Gly Thr Ser His Tyr Ala Lys Pro Leu Thr Leu Ala
```

FIG. 11

```
   3040          3050          3060          3070          3080
ATT ATT TCT TCA GAT ATT CGG GCT AAT CGA TAC ATG TAC ACT GTG GAC TCA
Ile Ile Ser Ser Asp Ile Arg Ala Asn Arg Tyr Met Tyr Thr Val Asp Ser

  3090          3100          3110       3120       3130       3140
ACA GAG TTC ACT TCT GAC GAG GAT T AAAAGTGGGC GGGGCCAAGA GGGGTATAAA
Thr Glu Phe Thr Ser Asp Glu Asp End

      3150       3160       3170       3180       3190       3200
TAGGTGGGGA GGTTGAGGGG AGCCGTAGTT TCTGTTTTTC CCAGACTGGG GGGGACAAC ATG
                                                                Met

      3210          3220          3230          3240          3250
GCC GAG GAA GGG CGC ATT TAT GTG CCT TAT GTA ACT GCC CGC CTG CCC AAG
Ala Glu Glu Gly Arg Ile Tyr Val Pro Tyr Val Thr Ala Arg Leu Pro Lys

     3260          3270          3280          3290          3300
TGG TCG GGT TCG GTG CAG GAT AAG ACG GGC TCG AAC ATG TTG GGG GGT GTG
Trp Ser Gly Ser Val Gln Asp Lys Thr Gly Ser Asn Met Leu Gly Gly Val

   3310          3320          3330          3340          3350
GTA CTC CCT CCT AAT TCA CAG GCG CAC CGG ACG GAG ACC GTG GGC ACT GAG
Val Leu Pro Pro Asn Ser Gln Ala His Arg Thr Glu Thr Val Gly Thr Glu
```

FIG. IJ

```
  3360         3370          3380         3390         3400
GCC ACC AGA GAC AAC CTG CAC GCC GAG GGA GCG CGT CGT CCT GAG GAT CAG
Ala Thr Arg Asp Asn Leu His Ala Glu Gly Ala Arg Arg Pro Glu Asp Gln

  3410         3420         3430          3440         3450
ACG CCC TAC ATG ATC TTG GTG GAG GAC TCT CTG GGA GGT TTG AAG AGG CGA
Thr Pro Tyr Met Ile Leu Val Glu Asp Ser Leu Gly Gly Leu Lys Arg Arg

 3460          3470         3480         3490          3500
ATG GAC TTG CTG GAA GAA TCT AAT CAG CAG CTG CTG GCA ACT CTC AAC CGT
Met Asp Leu Leu Glu Glu Ser Asn Gln Gln Leu Leu Ala Thr Leu Asn Arg

3510         3520          3530         3540         3550
CTC CGT ACA GGA CTC GCT GCC TAT GTG CAG GCT AAC CTT GTG GGC GGC CAA
Leu Arg Thr Gly Leu Ala Ala Tyr Val Gln Ala Asn Leu Val Gly Gly Gln

3560         3570         3580        3590        3600        3610
GTT AAC CCC TTT GTT TAAATA AAAATACACT CATACAGTTT ATTATGCTGT
Val Asn Pro Phe Val End

       3620        3630        3640        3650        3660        3670
CAATAAAATT CTTTATTTTT CCTGTGATAA TACCGTGTCC AGCGTGCTCT GTCAATAAGG

       3680        3690        3700        3710        3720        3730
GTCCTATGCA TCCTGAGAAG GGCCTCATAT ACCCATGGCA TGAATATTAA GATACATGGG
```

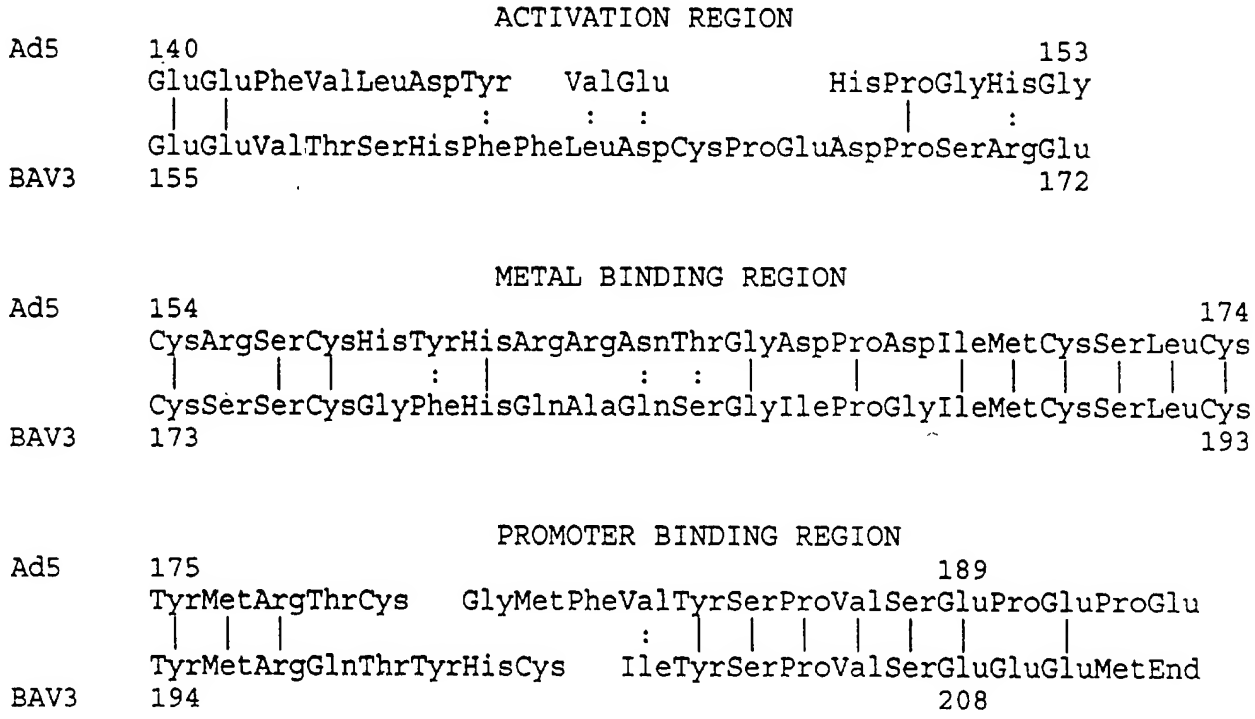
FIG. 1K

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: Suresh K. MITTAL et al.
Appln No.: 10/046,938
Docket No.: 293102002103

```
      3740        3750        3760        3770        3780        3790
CATAAGGCCC TCAGAAGGGT TGAGGTAGAG CCACTGCAGA CTTTCGTGGG GAGGTAAGGT

      3800        3810        3820        3830        3840        3850
GTTGTAAATA ATCCAGTCAT ACTGACTGTG CTGGGCGTGG AAGGAAAAGA TGTCTTTTAG

      3860        3870        3880        3890        3900        3910
AAGAAGGGTG ATTGGCAAAG GGAGGCTCTT AGTGTAGGTA TTGATAAATC TGTTCAGTTG

      3920        3930        3940        3950        3960        3970
GGAGGGATGC ATTCGGGGGC TAATAAGGTG GAGTTTAGCC TGAATCTTAA GGTTGGCAAT

      3980        3990        4000        4010        4020        4030
GTTGCCCCCT AGGTCTTTGC GAGGATTCAT GTTGTGCAGT ACCACAAAAA CAGAGTAGCC

      4040        4050        4060
TGTGCATTTG GGGAATTTAT CATGAAGCT T
```

FIG. IL

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: [redacted]sh K. MITTAL et al
Application No.: 10/046,938
Docket No 29310200210 3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Ad5 140 153
GluGluPheValLeuAspTyr ValGlu HisProGlyHisGly
GluGluValThrSerHisPhePheLeuAspCysProGluAspProSerArgGlu
BAV3 155 172
METAL BINDING REGION
Ad5 154 174
CysArgSerCysHisTyrHisArgArgAsnThrGlyAspProAspIleMetCysSerLeuCys
CysSerSerCysGlyPheHisGlnAlaGlnSerGlyIleProGlyIleMetCysSerLeuCys
BAV3 173 193
PROMOTER BINDING REGION
Ad5 175 189
TyrMetArgThrCys GlyMetPheValTyrSerProValSerGluProGluProGlu
TyrMetArgGlnThrTyrHisCys IleTyrSerProValSerGluGluGluMetEnd
BAV3 194 208

FIG. 2A

```
                                        Rb BINDING SEQUENCE
Ad5      120                                          132
         IleAspLeuThrCysHisGluAlaGlyPheProProSer
          :  |  |     |  |  |              |  |  |
         ValAspLeuGluCysHisGluVal    LeuProProSer
BAV3     26                                           37
```

FIG. 2B

```
Ad5      82                                                                  100
         LeuAspPheSerThrProGlyArgAlaAlaAlaAlaValAlaPheLeuSerPheIle
          |  |        |  |  |  |        |  |     |       |     |  |
         LeuAsp      ThrProGlyArgValValAlaAlaLeuAlaLeuLeuValPheIle
BAV3      83                                                                  99
```

FIG. 3A

```
Ad5      20                  26
         GlnSerSerAsnSerThrSer
          |  |  |     |  |  |
         GlnSerSerArgSerThrSer
BAV3     136                 142
```

FIG. 3B

```
Ad5 150 GlnLysTyrSerIleGluGlnLeuThrThrTyrTrpLeuGlnProGlyAspAspPheGlu
BAV3 74 GluArgTyrSerPheGluAspIleLysSerTyrGluAlaLeuProGluAspAsnLeuGlu

170     GluAlaIleArgValTyrAlaLysValAlaLeuArgProAspCysLysTyrLysIleSer
94      GlnLeuIleAlaMetHisAlaLysIleLysLeuLeuProGlyArgGluTyrGluLeuThr

190     LysLeuValAsnIleArgAsnCysCysTyrIleSerGlyAsnGlyAlaGluValGluIle
114     GlnProLeuAsnIleThrSerCysAlaTyrValLeuGlyAsnGlyAlaThrIleArgVal

210     AspThrGluAspArgValAlaPheArgCysSerMetIleAsnMetTrpProGlyValLeu
134     ThrGlyGluAlaSerProAlaIleArgValGlyAlaMetAlaValGlyProCysValThr

230     GlyMetAspGlyValValIleMetAsnValArgPheThr  GlyProAsnPheSerGly
154     GlyMetThrGlyValThrPheValAsnCysArgPheGluArgGluSerThrIleArgGly

249     ThrValPheLeuAlaAsnThrAsnLeuIleLeuHisGlyValSerPheTyr  GlyPhe
174     SerLeuIleArgAlaSerThrHisValLeuPheHisGlyCys  TyrPheMetGlyIle

268     AsnAsnThrCysValGluAlaTrpThrAspValArgValArgGlyCysAlaPheTyrCys
193     MetGlyThrCysIleGluValGlyAlaGlyAlaTyrIleArgGlyCysGluPheValGly

288     CysTrpLysGlyValValCysArgProLysSerArgAla  SerIleLysLysCysLeu
213     CysTyrArgGlyIle  CysSerThrSerAsnArgAspIleLysValArgGlnCysAsn

307     PheGluArgCysThrLeuGlyIleLeuSerGluGlyAsnSerArgValArgHisAsnVal
232     PheAspLysCysLeuLeuGlyIleThrCysLysGlyAspTyrArgLeuSerGlyAsnVal

327     AlaSerAspCysGlyCysPheMetLeuValLysSerValAlaValIleLysHisAsnMet
252     CysSerGluThrPheCysPheAlaHisLeuGluGlyGluGlyLeuValLysAsnAsnThr
```

FIG. 4A

```
347     Val   CysGlyAsn       CysGluAspArgAlaSerGlnMetLeuThrCysSerAsp
272     ValLysSerProSerArgTrpThrSerGluSerGlyPheSerMetIleThrCysAlaAsp

364     GlyAsnCysHisLeuLeuLysThrIleHisVal   AlaSerHisSerArgLysAlaTrp
292     GlyArgValThrProLeuGlySerLeuHisIleValGlyAsnArgCysArgArg   Trp

383     ProValPheGluHisAsnIleLeuHisArgCysSerLeuHisLeuGlyAsnArgArgGly
311     ProThrMetGlnGlyAsnValPheIleMetSerLysLeuTyrLeuGlyAsnArgIleGly

403       ValPheLeuProTyrGlnCysAsnLeuSerHisThrLysIleLeuLeuGluProGlu
331     ThrValAlaLeuPro   GlnCysAlaPheTyrLysSerSerIleCysLeuGluGluArg

422     SerMetSerLysValAsnLeuAsnGlyValPheAspMetThrMetLysIleTrpLysVal
350     AlaThrAsnLysLeuValLeuAlaCysAlaPheGluAsnAsnValLeuValTyrLysVal

442     LeuArgTyrAspGluThrArgThrArgCysArgProCysGluCysGlyGlyLysHisIle
370     LeuArgArgGluSerProSerThr   ValLysMetCysValCysGlyThrSerHisTyr

462     ArgAsnGlnProValMetLeuAspVal   ThrGluGluLeuArgProAspHisLeuVal
389       AlaLysProLeuThrLeuAlaIleIleSerSerAspIleArgAlaAsnArgTyrMet

481     LeuAlaCysHisArgAlaGluPheGlySerSerAspGluAspThrAspEnd
408     TyrThrValAspSerThrGluPhe   ThrSerAspGluAspEnd
```

FIG. 4B

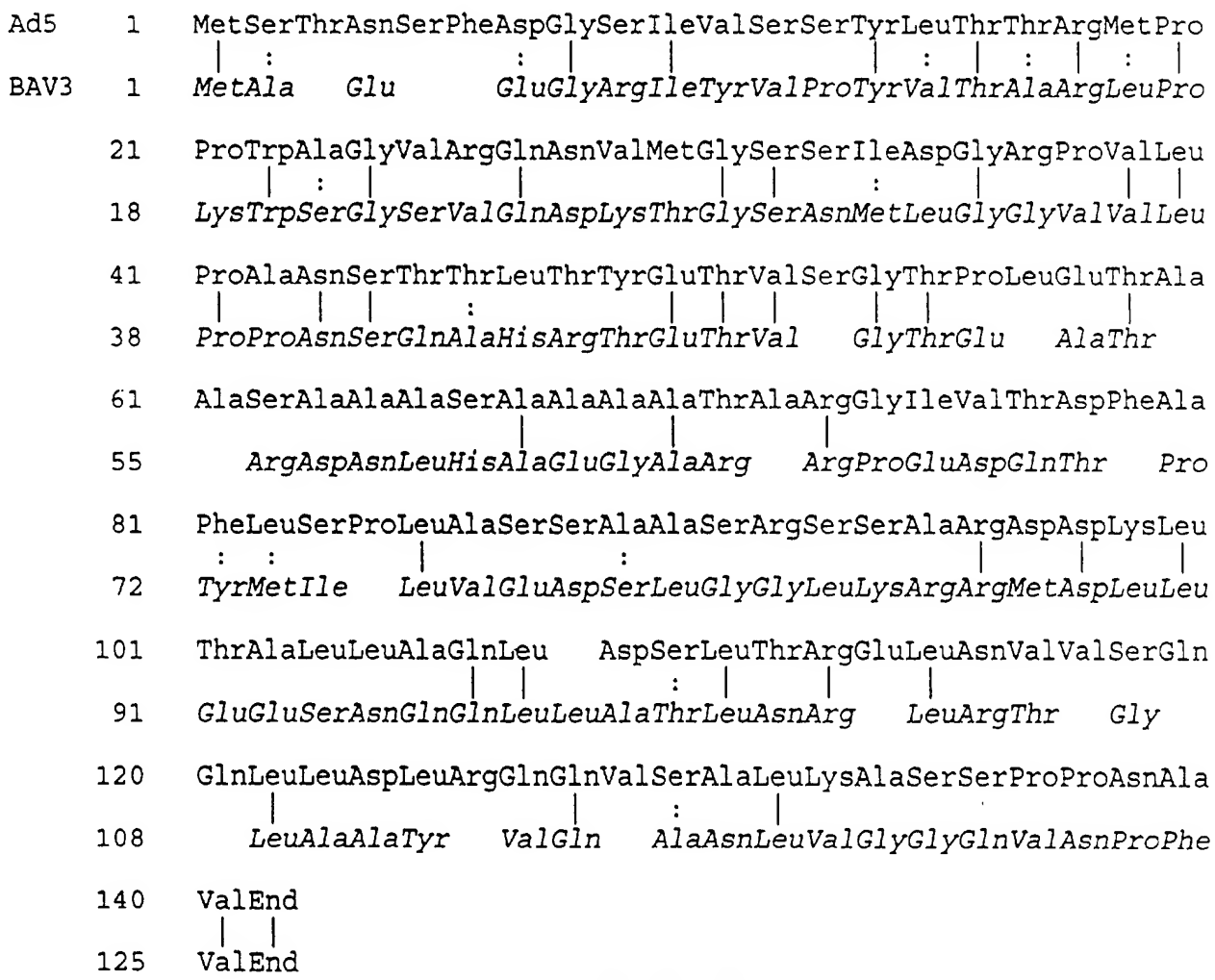
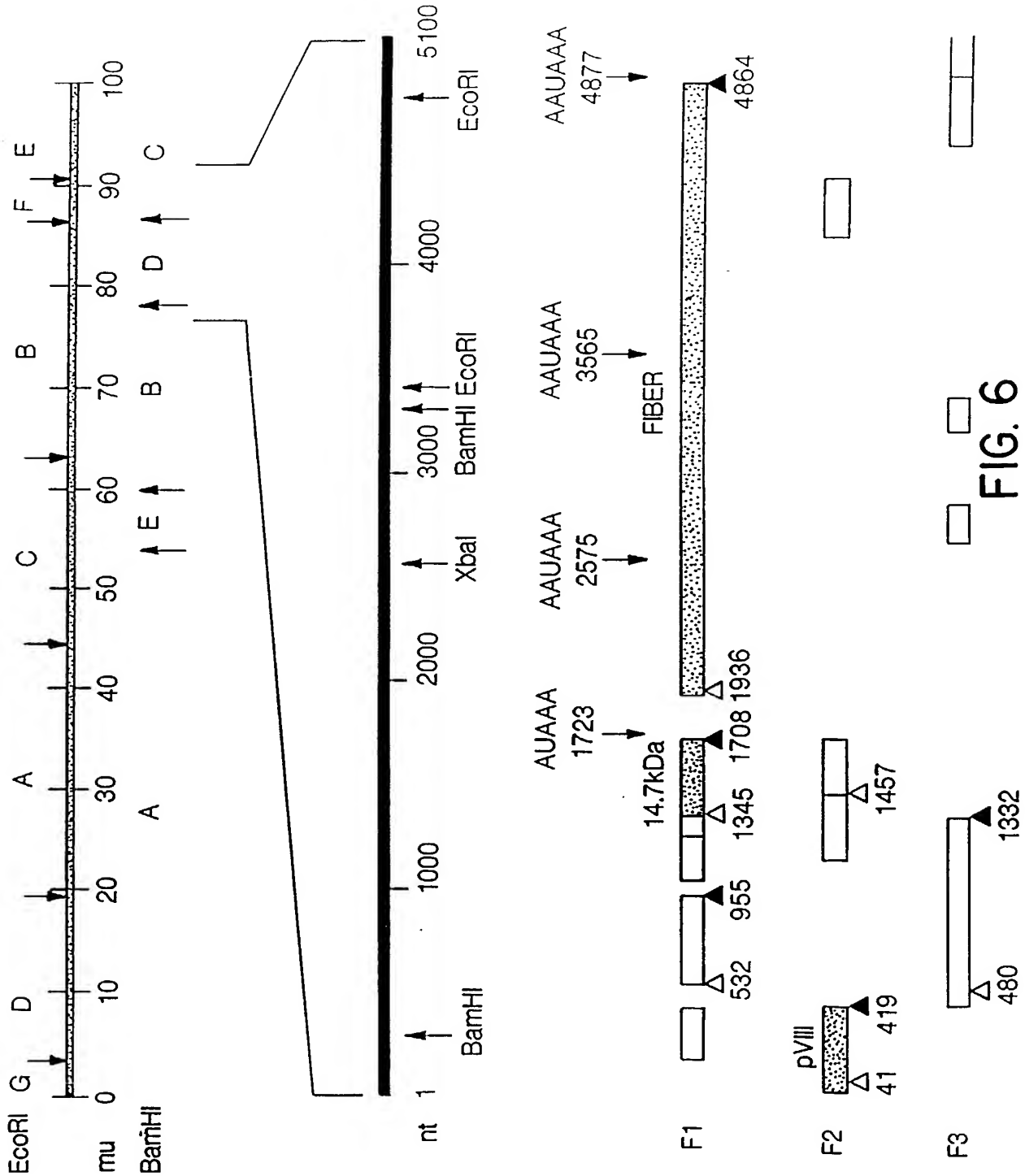


FIG. 5

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventor: [redacted]esh K. MITTAL et al.
Application No 10/046,938
Docket No. 29310200210


EcoRI
G
D
A
C
B
F
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0
10
20
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60
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80
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mu
BamHI
A
E
B
D
C
1
1000
2000
3000
4000
5100
nt
BamHI
XbaI
BamHI
EcoRI
EcoRI
AUAAA
1723
AAUAAA
2575
AAUAAA
3565
AAUAAA
4877
14.7kDa
1345
1708
1936
4864
FIBER
F1
532
955
F2
pVIII
41
419
1457
F3
480
1332

FIG. 6

```
                10                  20                  30                  40                  50
    C CTC ATC AAA CAA CCC GTG GTG GGC ACC ACC CAC GTG GAA ATG CCT CGC AAC
ORF 1 Leu Ile Lys Gln Pro Val Val Gly Thr Thr His Val Glu Met Pro Arg Asn

          60                  70                  80                  90                  100
    GAA GTC CTA GAA CAA CAT CTG ACC TCA CAT GGC GCT CAA ATC GCG GGC GGA
    Glu Val Leu Glu Gln His Leu Thr Ser His Gly Ala Gln Ile Ala Gly Gly

        110                 120                 130                 140                 150
    GGC GCT GCG GGC GAT TAC TTT AAA AGC CCC ACT TCA GCT CGA ACC CTT ATC
    Gly Ala Ala Gly Asp Tyr Phe Lys Ser Pro Thr Ser Ala Arg Thr Leu Ile

      160                 170                 180                 190                 200
    CCG CTC ACC GCC TCC TGC TTA AGA CCA GAT GGA GTC TTT CAA CTA GGA GGA
    Pro Leu Thr Ala Ser Cys Leu Arg Pro Asp Gly Val Phe Gln Leu Gly Gly

    210                 220                 230                 240                 250
    GGC TCG CGT TCA TCT TTC AAC CCC CTG CAA ACA GAT TTT GCC TTC CAC GCC
    Gly Ser Arg Ser Ser Phe Asn Pro Leu Gln Thr Asp Phe Ala Phe His Ala

    260                 270                 280                 290                 300
    CTG CCC TCC AGA CCG CGC CAC GGG GGC ATA GGA TCC AGG CAG TTT GTA GAG
    Leu Pro Ser Arg Pro Arg His Gly Gly Ile Gly Ser Arg Gln Phe Val Glu
```

FIG. 7A

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventor: [redacted]resh K. MITTAL et al
Appln. No.: 10/046,938
Docket No. 293102002103

```
310           320           330           340           350
GAA TTT GTG CCC GCC GTC TAC CTC AAC CCC TAC TCG GGA CCG CCG GAC TCT
Glu Phe Val Pro Ala Val Tyr Leu Asn Pro Tyr Ser Gly Pro Pro Asp Ser

360           370           380           390           400
TAT CCG GAC CAG TTT ATA CGC CAC TAC AAC GTG TAC AGC AAC TCT GTG AGC
Tyr Pro Asp Gln Phe Ile Arg His Tyr Asn Val Tyr Ser Asn Ser Val Ser
                                                  ORF 2  Ala

410           420           430           440           450           460
GGT TAT AGC T GAG ATT GTA AGA CTC TCC TAT CTG TCT CTG TGC TGC TTT TCC
Gly Tyr Ser
 Val Ile Ala  Glu Ile Val Arg Leu Ser Tyr Leu Ser Leu Cys Cys Phe Ser

        470           480           490           500           510
GCT TCA AGC CCC ACA AGC ATG AAG GGG TTT CTG CTC ATC TTC AGC CTG CTT
Ala Ser Ser Pro Thr Ser Met Lys Gly Phe Leu Leu Ile Phe Ser Leu Leu

      520           530           540           550           560
GTG CAT TGT CCC CTA ATT CAT GTT GGG ACC ATT AGC TTC TAT GCT GCA AGG
                ORF 3  Phe Met Leu Gly Pro Leu Ala Ser Met Leu Gln Gly
Val His Cys Pro Leu Ile His Val Gly Thr Ile Ser Phe Tyr Ala Ala Arg
```

FIG. 7B

570 580 590 600 610
CCC GGG TCT GAG CCT AAC GCG ACT TAT GTT TGT GAC TAT GGA AGC GAG TCA
Pro Gly Leu Ser Leu Thr Arg Leu Met Phe Val Thr Met Glu Ala Ser Gln
Pro Gly Ser Glu Pro Asn Ala Thr Tyr Val Cys Asp Tyr Gly Ser Glu Ser

620 630 640 650 660
GAT TAC AAC CCC ACC ACG GTT CTG TGG TTG GCT CGA GAG ACC GAT GGC TCC
Ile Thr Thr Pro Pro Arg Phe Cys Gly Trp Leu Glu Arg Pro Met Ala Pro
Asp Tyr Asn Pro Thr Thr Val Leu Trp Leu Ala Arg Glu Thr Asp Gly Ser

670 680 690 700 710
TGG ATC TCT GTT CTT TTC CGT CAC AAC GGC TCC TCA ACT GCA GCC CCC GGG
Gly Ser Leu Phe Phe Ser Val Thr Thr Ala Pro Gln Leu Gln Pro Pro Gly
Trp Ile Ser Val Leu Phe Arg His Asn Gly Ser Ser Thr Ala Ala Pro Gly

720 730 740 750 760
GTC GTC GCG CAC TTT ACT GAC CAC AAC AGC AGC ATT GTG GTG CCC CAG TAT
Ser Ser Arg Thr Leu Leu Thr Thr Thr Ala Ala Leu Trp Cys Pro Ser Ile
Val Val Ala His Phe Thr Asp His Asn Ser Ser Ile Val Val Pro Gln Tyr

770 780 790 800 810
TAC CTC CTC AAC AAC TCA CTC TCT AAG CTC TGC TGC TCA TAC CGG CAC AAC
Thr Ser Ser Thr Thr His Ser Leu Ser Ser Ala Ala His Thr Gly Thr Thr
Tyr Leu Leu Asn Asn Ser Leu Ser Lys Leu Cys Cys Ser Tyr Arg His Asn

FIG. 7C

820 830 840 850 860
GAG CGT TCT CAG TTT ACC TGC AAA CAA GCT GAC GTC CCT ACC TGT CAC GAG
Ser Val Leu Ser Leu Pro Ala Asn Lys Leu Thr Ser Leu Pro Val Thr Ser
Glu Arg Ser Gln Phe Thr Cys Lys Gln Ala Asp Val Pro Thr Cys His Glu

870 880 890 900 910 920
CCC GGC AAG CCG CTC ACC CTC CGC GTC TCC CCC GCG CTG GGA ACT GCC CAC
Pro Ala Ser Arg Ser Pro Ser Ala Ser Pro Pro Arg Trp Glu Leu Pro Thr
Pro Gly Lys Pro Leu Thr Leu Arg Val Ser Pro Ala Leu Gly Thr Ala His

930 940 950 960 970
CAA GCA GTC ACT TGG TTT TTT CAA AAT GTA CCC ATA GCT ACT GTT TAC CGA
Lys Gln Ser Leu Gly Phe Phe Lys Met Tyr Pro
Gln Ala Val Thr Trp Phe Phe Gln Asn Val Pro Ile Ala Thr Val Tyr Arg

980 990 1000 1010 1020
CCT TGG GGC AAT GTA ACT TGG TTT TGT CCT CCC TTC ATG TGT ACC TTT AAT
Pro Trp Gly Asn Val Thr Trp Phe Cys Pro Pro Phe Met Cys Thr Phe Asn

1030 1040 1050 1060 1070
GTC AGC CTG AAC TCC CTA CTT ATT TAC AAC TTT TCT GAC AAA ACC GGG GGG
Val Ser Leu Asn Ser Leu Leu Ile Tyr Asn Phe Ser Asp Lys Thr Gly Gly

FIG. 7D

```
     1080          1090          1100          1110          1120
CAA TAC ACA GCT CTC ATG CAC TCC GGA CCT GCT TCC CTC TTT CAG CTC TTT
Gln Tyr Thr Ala Leu Met His Ser Gly Pro Ala Ser Leu Phe Gln Leu Phe

   1130          1140          1150          1160          1170
AAG CCA ACG ACT TGT GTC ACC AAG GTG GAG GAC CCG CCG TAT GCC AAC GAC
Lys Pro Thr Thr Cys Val Thr Lys Val Glu Asp Pro Pro Tyr Ala Asn Asp

  1180          1190          1200          1210          1220
CCG GCC TCG CCT GTG TGG CGC CCA CTG CTT TTT GCC TTC GTC CTC TGC ACC
Pro Ala Ser Pro Val Trp Arg Pro Leu Leu Phe Ala Phe Val Leu Cys Thr

 1230          1240          1250          1260          1270
GGC TGC GCG GTG TTG TTA ACC GCC TTC GGT CCA TCG ATT CTA TCC GGT ACC
                    ORF 4  Pro Pro Ser Val His Arg Phe Tyr Pro Val Pro
Gly Cys Ala Val Leu Leu Thr Ala Phe Gly Pro Ser Ile Leu Ser Gly Thr

1280          1290          1300          1310          1320
CGA AAG CTT ATC TCA GCC CGC TTT TGG AGT CCC GAG CCC TAT ACC ACC CTC
 Glu Ser Leu Ser Gln Pro Ala Phe Gly Val Pro Ser Pro Ile Pro Pro Ser
Arg Lys Leu Ile Ser Ala Arg Phe Trp Ser Pro Glu Pro Tyr Thr Thr Leu
```

FIG. 7E

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: [redacted] resh K. MITTAL et al.
Application No.: 10/046,938
Docket No.: 293102002103
Sheet 23 of 50

```
1330          1340          1350          1360          1370          1380
  CAC T AAC AGT CCC CCC ATG GAG CCA GAC GGA GTT CAT GCC GAG CAG CAG TTT
   Thr  Asn Ser Pro Pro Met Glu Pro Asp Gly Val His Ala Glu Gln Gln Phe
  His

          1390          1400          1410          1420          1430
  ATC CTC AAT CAG ATT TCC TGC GCC AAC ACT GCC CTC CAG CGT CAA AGG GAG
  Ile Leu Asn Gln Ile Ser Cys Ala Asn Thr Ala Leu Gln Arg Gln Arg Glu

        1440          1450          1460          1470          1480
  GAA CTA GCT TCC CTT GTC ATG TTG CAT GCC TGT AAG CGT GGC CTC TTT TGT
  Glu Leu Ala Ser Leu Val Met Leu His Ala Cys Lys Arg Gly Leu Phe Cys
    ORF 5  Leu Pro Leu Ser Cys Cys Met Pro Val Ser Val Ala Ser Phe Val

       1490          1500          1510          1520          1530
  CCA GTC AAA ACT TAC AAG CTC AGC CTC AAC GCC TCG GCC AGC GAG CAC AGC
  Pro Val Lys Thr Tyr Lys Leu Ser Leu Asn Ala Ser Ala Ser Glu His Ser
   Gln Ser Lys Leu Thr Ser Ser Ala Ser Thr Pro Arg Pro Ala Ser Thr Ala

      1540          1550          1560          1570          1580
  CTG CAC TTT GAA AAA AGT CCC TCC CGA TTC ACC CTG GTC AAC ACT CAC GCC
  Leu His Phe Glu Lys Ser Pro Ser Arg Phe Thr Leu Val Asn Thr His Ala
   Cys Thr Leu Lys Lys Val Pro Pro Asp Ser Pro Trp Ser Thr Leu Thr Pro
```

FIG. 7F

```
   1590          1600          1610          1620          1630
GGA GCT TCT GTG CGA GTG GCC CTA CAC CAC CAG GGA GCT TCC GGC AGC ATC
Gly Ala Ser Val Arg Val Ala Leu His His Gln Gly Ala Ser Gly Ser Ile
 Glu Leu Leu Cys Glu Trp Pro Tyr Thr Thr Arg Glu Leu Pro Ala Ala Ser

  1640          1650          1660          1670          1680
CGC TGT TCC TGT TCC CAC GCC GAG TGC CTC CCC GTC CTC CTC AAG ACC CTC
Arg Cys Ser Cys Ser His Ala Glu Cys Leu Pro Val Leu Leu Lys Thr Leu
 Ala Val Pro Val Pro Thr Pro Ser Ala Ser Pro Ser Ser Ser Arg Pro Ser

 1690          1700          1710          1720          1730          1740
TGT GCC TTT AAC TTT TTA GAT TAG CTGAAAGCAA ATATAAAATG GTGTGCTTAC
Cys Ala Phe Asn Phe Leu Asp
 Val Pro Leu Thr Phe

      1750          1760          1770          1780          1790
CGTAATTCTG TTTTGACTTG TGTGCTTGA TTT CTC CCC CTG CGC CGT AAT CCA GTG

 1800          1810          1820          1830          1840
CCC CTC TTC AAA ACT CTC GTA CCC TAT GCG ATT CGC ATA GGC ATA TTT TCT

1850          1860          1870          1880          1890
 AAA AGC TCT GAA GTC AAC ATC ACT CTC AAA CAC TTC TCC GTT GTA GGT TAC
```

FIG. 7G

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventor: Suresh K. MITTAL et al.
Application No.: 10/046,938
Docket No.: 29310200 2103

```
1900          1910          1920          1930          1940          1950
TTT CAT CTA CAG ATA AAG TCA TCC ACC GGT T AAC ATC ATG AAG AGA AGT GTG
            ORF 6  Ser His Pro Pro Val  Asn Ile Met Lys Arg Ser Val

         1960          1970          1980          1990          2000
CCC CAG GAC TTT AAT CTT GTG TAT CCG TAC AAG GCT AAG AGG CCC AAC ATC
Pro Gln Asp Phe Asn Leu Val Tyr Pro Tyr Lys Ala Lys Arg Pro Asn Ile

       2010          2020          2030          2040          2050
ATG CCG CCC TTT TTT GAC CGC AAT GGC TTT GTT GAA AAC CAA GAA GCC ACG
Met Pro Pro Phe Phe Asp Arg Asn Gly Phe Val Glu Asn Gln Glu Ala Thr

      2060          2070          2080          2090          2100
CTA GCC ATG CTT GTG GAA AAG CCG CTC ACG TTC GAC AAG GAA GGT GCG CTG
Leu Ala Met Leu Val Glu Lys Pro Leu Thr Phe Asp Lys Glu Gly Ala Leu

     2110          2120          2130          2140          2150
ACC CTG GGC GTC GGA CGC GGC ATC CGC ATT AAC CCC GCG GGG CTT CTG GAG
Thr Leu Gly Val Gly Arg Gly Ile Arg Ile Asn Pro Ala Gly Leu Leu Glu

   2160          2170          2180          2190          2200
ACA AAC GAC CTC GCG TCC GCT GTC TTC CCA CCG CTG GCC TCC GAT GAG GCC
Thr Asn Asp Leu Ala Ser Ala Val Phe Pro Pro Leu Ala Ser Asp Glu Ala
```

FIG. 7H

```
  2210          2220          2230          2240          2250
GGC AAC GTC ACG CTC AAC ATG TCT GAC GGG CTA TAT ACT AAG GAC AAC AAG
Gly Asn Val Thr Leu Asn Met Ser Asp Gly Leu Tyr Thr Lys Asp Asn Lys

  2260          2270          2280          2290          2300
CTA GCT GTC AAA GTA GGT CCC GGG CTG TCC CTC GAC TCC AAT AAT GCT CTC
Leu Ala Val Lys Val Gly Pro Gly Leu Ser Leu Asp Ser Asn Asn Ala Leu

 2310          2320          2330          2340          2350
CAG GTC CAC ACA GGC GAC GGG CTC ACG GTA ACC GAT GAC AAG GTG TCT CTA
Gln Val His Thr Gly Asp Gly Leu Thr Val Thr Asp Asp Lys Val Ser Leu

 2360          2370          2380          2390          2400
AAT ACC CAA GCT CCC CTC TCG ACC ACC AGC GCG GGC CTC TCC CTA CTT CTG
Asn Thr Gln Ala Pro Leu Ser Thr Thr Ser Ala Gly Leu Ser Leu Leu Leu

 2410          2420          2430          2440          2450          2460
GGT CCC AGC CTC CAC TTA GGT GAG GAG GAA CGA CTA ACA GTA AAC ACC GGA
Gly Pro Ser Leu His Leu Gly Glu Glu Glu Arg Leu Thr Val Asn Thr Gly

          2470          2480          2490          2500          2510
GCG GGC CTC CAA ATT AGC AAT AAC GCT CTG GCC GTA AAA GTA GGT TCA GGT
Ala Gly Leu Gln Ile Ser Asn Asn Ala Leu Ala Val Lys Val Gly Ser Gly
```

FIG. 7I

```
      2520          2530          2540          2550          2560
ATC ACC GTA GAT GCT CAA AAC CAG CTC GCT GCA TCC CTG GGG GAC GGT CTA
Ile Thr Val Asp Ala Gln Asn Gln Leu Ala Ala Ser Leu Gly Asp Gly Leu

      2570          2580          2590          2600          2610
GAA AGC AGA GAT AAT AAA ACT GTC GTT AAG GCT GGG CCC GGA CTT ACA ATA
Glu Ser Arg Asp Asn Lys Thr Val Val Lys Ala Gly Pro Gly Leu Thr Ile

      2620          2630          2640          2650          2660
ACT AAT CAA GCT CTT ACT GTT GCT ACC GGG AAC GGC CTT CAG GTC AAC CCG
Thr Asn Gln Ala Leu Thr Val Ala Thr Gly Asn Gly Leu Gln Val Asn Pro

      2670          2680          2690          2700          2710
GAA GGG CAA CTG CAG CTA AAC ATT ACT GCC GGT CAG GGC CTC AAC TTT GCA
Glu Gly Gln Leu Gln Leu Asn Ile Thr Ala Gly Gln Gly Leu Asn Phe Ala

      2720          2730          2740          2750          2760
AAC AAC AGC CTC GCC GTG GAG CTG GGC TCG GGC CTG CAT TTT CCC CCT GGC
Asn Asn Ser Leu Ala Val Glu Leu Gly Ser Gly Leu His Phe Pro Pro Gly

      2770          2780          2790          2800          2810
CAA AAC CAA GTA AGC CTT TAT CCC GGA GAT GGA ATA GAC ATC CGA GAT AAT
Gln Asn Gln Val Ser Leu Tyr Pro Gly Asp Gly Ile Asp Ile Arg Asp Asn
```

FIG. 7J

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventor: Suresh K. MITTAL et al
Application No.: 10/046,938
Docket No 29310200210 3

2820 2830 2840 2850 2860
AGG GTG ACT GTG CCC GCT GGG CCA GGC CTG AGA ATG CTC AAC CAC CAA CTT
Arg Val Thr Val Pro Ala Gly Pro Gly Leu Arg Met Leu Asn His Gln Leu

2870 2880 2890 2900 2910
GCC GTA GCT TCC GGA GAC GGT TTA GAA GTC CAC AGC GAC ACC CTC CGG TTA
Ala Val Ala Ser Gly Asp Gly Leu Glu Val His Ser Asp Thr Leu Arg Leu

2920 2930 2940 2950 2960 2970
AAG CTC TCC CAC GGC CTG ACA TTT GAA AAT GGC GCC GTA CGA GCA AAA CTA
Lys Leu Ser His Gly Leu Thr Phe Glu Asn Gly Ala Val Arg Ala Lys Leu

2980 2990 3000 3010 3020
GGA CCA GGA CTT GGC ACA GAC GAC TCT GGT CGG TCC GTG GTT CGC ACA GGT
Gly Pro Gly Leu Gly Thr Asp Asp Ser Gly Arg Ser Val Val Arg Thr Gly

3030 3040 3050 3060 3070
CGA GGA CTT AGA GTT GCA AAC GGC CAA GTC CAG ATC TTC AGC GGA AGA GGC
Arg Gly Leu Arg Val Ala Asn Gly Gln Val Gln Ile Phe Ser Gly Arg Gly

3080 3090 3100 3110 3120
ACC GCC ATC GGC ACT GAT AGC AGC CTC ACT CTC AAC ATC CGG GCG CCC CTA
Thr Ala Ile Gly Thr Asp Ser Ser Leu Thr Leu Asn Ile Arg Ala Pro Leu

FIG. 7K

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: [redacted]sh K. MITTAL et al.
Application No. 10/046,938
Docket No.: 293102002103

```
     3130          3140          3150          3160          3170
CAA TTT TCT GGA CCC GCC TTG ACT GCT AGT TTG CAA GGC AGT GGT CCG ATT
Gln Phe Ser Gly Pro Ala Leu Thr Ala Ser Leu Gln Gly Ser Gly Pro Ile

   3180          3190          3200          3210          3220
ACT TAC AAC AGC AAC AAT GGC ACT TTC GGT CTC TCT ATA GGC CCC GGA ATG
Thr Tyr Asn Ser Asn Asn Gly Thr Phe Gly Leu Ser Ile Gly Pro Gly Met

  3230          3240          3250          3260          3270
TGG GTA GAC CAA AAC AGA CTT CAG GTA AAC CCA GGC GCT GGT TTA GTC TTC
Trp Val Asp Gln Asn Arg Leu Gln Val Asn Pro Gly Ala Gly Leu Val Phe

 3280          3290          3300          3310          3320
CAA GGA AAC AAC CTT GTC CCA AAC CTT GCG GAT CCG CTG GCT ATT TCC GAC
Gln Gly Asn Asn Leu Val Pro Asn Leu Ala Asp Pro Leu Ala Ile Ser Asp

3330          3340          3350          3360          3370
AGC AAA ATT AGT CTC AGT CTC GGT CCC GGC CTG ACC CAA GCT TCC AAC GCC
Ser Lys Ile Ser Leu Ser Leu Gly Pro Gly Leu Thr Gln Ala Ser Asn Ala

3380          3390          3400          3410          3420
CTG ACT TTA AGT TTA GGA AAC GGG CTT GAA TTC TCC AAT CAA GCC GTT GCT
Leu Thr Leu Ser Leu Gly Asn Gly Leu Glu Phe Ser Asn Gln Ala Val Ala
```

FIG. 7L

```
3430          3440          3450          3460          3470          3480
ATA AAA GCG GGC CGG GGC TTA CGC TTT GAG TCT TCC TCA CAA GCT TTA GAG
Ile Lys Ala Gly Arg Gly Leu Arg Phe Glu Ser Ser Ser Gln Ala Leu Glu

          3490          3500          3510          3520          3530
AGC AGC CTC ACA GTC GGA AAT GGC TTA ACG CTT ACC GAT ACT GTG ATC CGC
Ser Ser Leu Thr Val Gly Asn Gly Leu Thr Leu Thr Asp Thr Val Ile Arg

       3540          3550          3560          3570          3580
CCC AAC CTA GGG GAC GGC CTA GAG GTC AGA GAC AAT AAA ATC ATT GTT AAG
Pro Asn Leu Gly Asp Gly Leu Glu Val Arg Asp Asn Lys Ile Ile Val Lys

       3590          3600          3610          3620          3630
CTG GGC GCG AAT CTT CGT TTT GAA AAC GGA GCC GTA ACC GCC GGC ACC GTT
Leu Gly Ala Asn Leu Arg Phe Glu Asn Gly Ala Val Thr Ala Gly Thr Val

       3640          3650          3660          3670          3680
AAC CCT TCT GCG CCC GAG GCA CCA CCA ACT CTC ACT GCA GAA CCA CCC CTC
Asn Pro Ser Ala Pro Glu Ala Pro Pro Thr Leu Thr Ala Glu Pro Pro Leu

   3690          3700          3710          3720          3730
CGA GCC TCC AAC TCC CAT CTT CAA CTG TCC CTA TCG GAG GGC TTG GTT GTG
Arg Ala Ser Asn Ser His Leu Gln Leu Ser Leu Ser Glu Gly Leu Val Val
```

FIG. 7M

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: [redacted]esh K. MITTAL et al.
Application No.: 10/046,938
Docket No.: 29310200 2103

```
  3740          3750          3760          3770          3780
CAT AAC AAC GCC CTT GCT CTC CAA CTG GGA GAC GGC ATG GAA GTA AAT CAG
His Asn Asn Ala Leu Ala Leu Gln Leu Gly Asp Gly Met Glu Val Asn Gln

  3790          3800          3810          3820          3830
CAC GGA CTT ACT TTA AGA GTA GGC TCG GGT TTG CAA ATG CGT GAC GGC ATT
His Gly Leu Thr Leu Arg Val Gly Ser Gly Leu Gln Met Arg Asp Gly Ile

3840          3850          3860          3870          3880
TTA ACA GTT ACA CCC AGC GGC ACT CCT ATT GAG CCC AGA CTG ACT GCC CCA
Leu Thr Val Thr Pro Ser Gly Thr Pro Ile Glu Pro Arg Leu Thr Ala Pro

3890          3900          3910          3920          3930
CTG ACT CAG ACA GAG AAT GGA ATC GGG CTC GCT CTC GGC GCC GGC TTG GAA
Leu Thr Gln Thr Glu Asn Gly Ile Gly Leu Ala Leu Gly Ala Gly Leu Glu

3940          3950          3960          3970          3980          3990
TTA GAC GAG AGC GCG CTC CAA GTA AAA GTT GGG CCC GGC ATG CGC CTG AAC
Leu Asp Glu Ser Ala Leu Gln Val Lys Val Gly Pro Gly Met Arg Leu Asn

          4000          4010          4020          4030          4040
CCT GTA GAA AAG TAT GTA ACC CTG CTC CTG GGT CCT GGC CTT AGT TTT GGG
Pro Val Glu Lys Tyr Val Thr Leu Leu Leu Gly Pro Gly Leu Ser Phe Gly
```

FIG. 7N

```
      4050          4060          4070          4080          4090
CAG CCG GCC AAC AGG ACA AAT TAT GAT GTG CGC GTT TCT GTG GAG CCC CCC
Gln Pro Ala Asn Arg Thr Asn Tyr Asp Val Arg Val Ser Val Glu Pro Pro

      4100          4110          4120          4130          4140
ATG GTT TTC GGA CAG CGT GGT CAG CTC ACA TTT TTA GTG GGT CAC GGA CTA
Met Val Phe Gly Gln Arg Gly Gln Leu Thr Phe Leu Val Gly His Gly Leu

      4150          4160          4170          4180          4190
CAC ATT CAA AAT TCC AAA CTT CAG CTC AAT TTG GGA CAA GGC CTC AGA ACT
His Ile Gln Asn Ser Lys Leu Gln Leu Asn Leu Gly Gln Gly Leu Arg Thr

   4200          4210          4220          4230          4240
GAC CCC GTC ACC AAC CAG CTG GAA GTG CCC CTC GGT CAA GGT TTG GAA ATT
Asp Pro Val Thr Asn Gln Leu Glu Val Pro Leu Gly Gln Gly Leu Glu Ile

  4250          4260          4270          4280          4290
GCA GAC GAA TCC CAG GTT AGG GTT AAA TTG GGC GAT GGC CTG CAG TTT GAT
Ala Asp Glu Ser Gln Val Arg Val Lys Leu Gly Asp Gly Leu Gln Phe Asp

 4300          4310          4320          4330          4340
TCA CAA GCT CGC ATC ACT ACC GCT CCT AAC ATG GTC ACT GAA ACT CTG TGG
Ser Gln Ala Arg Ile Thr Thr Ala Pro Asn Met Val Thr Glu Thr Leu Trp
```

FIG. 70

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventor: Suresh K. MITTAL et al.
Application No 10/046,938
Docket No.: 29310200210

```
4350          4360          4370          4380          4390
ACC GGA ACA GGC AGT AAT GCT AAT GTT ACA TGG CGG GGC TAC ACT GCC CCC
Thr Gly Thr Gly Ser Asn Ala Asn Val Thr Trp Arg Gly Tyr Thr Ala Pro

4400          4410          4420          4430          4440
GGC AGC AAA CTC TTT TTG AGT CTC ACT CGG TTC AGC ACT GGT CTA GTT TTA
Gly Ser Lys Leu Phe Leu Ser Leu Thr Arg Phe Ser Thr Gly Leu Val Leu

4450          4460          4470          4480          4490          4500
GGA AAC ATG ACT ATT GAC AGC AAT GCA TCC TTT GGG CAA TAC ATT AAC GCG
Gly Asn Met Thr Ile Asp Ser Asn Ala Ser Phe Gly Gln Tyr Ile Asn Ala

          4510          4520          4530          4540          4550
GGA CAC GAA CAG ATC GAA TGC TTT ATA TTG TTG GAC AAT CAG GGT AAC CTA
Gly His Glu Gln Ile Glu Cys Phe Ile Leu Leu Asp Asn Gln Gly Asn Leu

        4560          4570          4580          4590          4600
AAA GAA GGA TCT AAC TTG CAA GGC ACT TGG GAA GTG AAG AAC AAC CCC TCT
Lys Glu Gly Ser Asn Leu Gln Gly Thr Trp Glu Val Lys Asn Asn Pro Ser

       4610          4620          4630          4640          4650
GCT TCC AAA GCT GCT TTT TTG CCT TCC ACC GCC CTA TAC CCC ATC CTC AAC
Ala Ser Lys Ala Ala Phe Leu Pro Ser Thr Ala Leu Tyr Pro Ile Leu Asn
```

FIG. 7P

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventors: Suresh K. MITTAL et al.
Application No.: 10/046,938
Docket No.: 293102002103

```
     4660          4670          4680          4690          4700
GAA AGC CGA GGG AGT CTT CCT GGA AAA AAT CTT GTG GGC ATG CAA GCC ATA
Glu Ser Arg Gly Ser Leu Pro Gly Lys Asn Leu Val Gly Met Gln Ala Ile

   4710          4720          4730          4740          4750
CTG GGA GGC GGG GGC ACT TGC ACT GTG ATA GCC ACC CTC AAT GGC AGA CGC
Leu Gly Gly Gly Gly Thr Cys Thr Val Ile Ala Thr Leu Asn Gly Arg Arg

  4760          4770          4780          4790          4800
AGC AAC AAC TAT CCC GCG GGC CAG TCC ATA ATT TTC GTG TGG CAA GAA TTC
Ser Asn Asn Tyr Pro Ala Gly Gln Ser Ile Ile Phe Val Trp Gln Glu Phe

  4810          4820          4830          4840          4850
AAC ACC ATA GCC CGC CAA CCT CTG AAC CAC TCT ACA CTT ACT TTT TCT TAC
Asn Thr Ile Ala Arg Gln Pro Leu Asn His Ser Thr Leu Thr Phe Ser Tyr

4860          4870          4880          4890          4900
TGG ACT TA AAT AAG TTG GAA ATA AAG AGT TAA ACT GAA TGT TTA AGT GCA
Trp Thr

4910          4920          4930          4940          4950
ACA GAC TTT TAT TGG TTT TGG CTC ACA ACA AAT TAC AAC AGC ATA GAC AAG

4960          4970          4980          4990          5000
TCA TAC CGG TCA AAC AAC ACA GGC TCT CGA AAA CGG GCT AAC CGC TCC AAG
```

FIG. 7Q

Title: RECOMBINANT PROTEIN PRODUCTION IN BOVINE ADENOVIRUS EXPRESSION VECTOR SYSTEM
Inventor: [redacted] K. MITTAL et al.
Application [redacted] 10/046,938
Docket No.: 293102002103

```
5010       5020       5030       5040       5050       5060
  AAT CTG TCA CGC AGA CGA GCA AGT CCT AAA TGT TTT TTC ACT CTC TTC GGG

5070       5080       5090       5100
GCC AAG TTC AGC ATG TAT CGG ATT TTC TGC TTA CAC CTT T
```

FIG. 7R

```
Ad2     MSKEIPTPYMWSYQPQMGLAAGAAQDYSTRINYMSAGPHMISRVNGIRAH    50
BAV3        LIKQPVVGTTHV----------------------EMPRNEVLEQH    23
Ad2     RNRILLEQAAITTTPRNNLNPRSWPAALVYQESPAPTTVVLPRDAQAEVQ   100
BAV3    LTSHGAQIAGGG-----AAGDYFKSPTSARTLIPLTASCL------RPDG    62
Ad2     MTNSGAQLAGGFRHRVRSPGQGITHLKIRGRGIQLNDESVSSSLGLRPDG   150
BAV3    VFQLGGGSRSSFNPLQTDFAFHALPSRPRHGGIGSRQFVEEFVPAVYLNP   112
Ad2     TFQIGGAGRSSFTPRQAILTLQTSSSEPRSGGIGTLQFIEEFVPSVYFNP   200
BAV3    YSGPPDSYPDQFIRHYNVYSNSVSGYS  139
Ad2     FSGPPGHYPDQFIPNFDAVKDSADGYD  227
```

FIG. 8A

```
BAV3    M------EPDGVHAEQQFILNQISCANTALQRQREELASLVMLHACKRGL    77
Ad5     MTDTLDLEMDGIITEQRLL--ERRRAAAEQQRMNQELQDMVNLHQCKRGI    48
BAV3    FCPVKTYKLSLNASASEHSLHFEKSPSRFTLVNTHAGASVRVALHHQGAS   127
Ad5     FCLVKQAKVTYDSNTTGHRLSYKLPTKRQKLVVMVGEKPITITQHSVETE    98
BAV3    GSIRCSCSHAECLPVLLKTLCAFNFLD      154
Ad5     GCIHSPCQGPEDLCTLIKTLCGLKDLIPFN   128
```

FIG. 8B

```
BAV3    - MKRSVPQD--FNLVYPYKAKR-----PNIMPPFFDRNGFVENQEATLAML -43
          :::. : .  :: :::: .       : . :::   ::: :      :..
Ad2     - MKRARPSEDTFNPVYPYDTETGPPTVPFLTPPFVSPNGFQESPPGVLSLR -50

BAV3    - VEKPLTFDKE-GALTLGVGRGIRINPAGLLETNDLASAVFPPLASDEAGN -92
          :  ::  :   : :.: .: :. .  :: : .. ...
Ad2     - VSEPL--DTSHGMLALKMGSGLTLDKAGNLTSQNVTTV----------- -86

BAV3    - VTLNMSDGLYTKDNKLAVKVGPGLSLDSNNALQVHTGDGLTVTDDKVSLN -142
            .  :      ...      :.. .  :: : :   : ::   .:..
Ad2     - -----TQPLKKTKSNISLDTSAPLTI-TSGALTVATTAPLIVTSGALSVQ -130

BAV3    - TQAPLSTTSAGLSLLLGPSLHLGEEERLTVNTGAGLQISNNALAVKVGSG -192
          .:::::.                . .:.. :   . .:   ::.   .
Ad2     - SQAPLT---------------VQDSKLSIATKGPITVSDGKLALQTSAP -164

BAV3    - ITVDAQNQLAASLGDGLESRDNKTVVKAGPGLTITNQALTVATGNGLQVN -242
          ..     :. .                    .   :: :::  : .:
Ad2     - LSGSDSDTLTVT--------------------ASPPLTTATGS-LGIN -191

BAV3    - PEGQLQLNITAGQGLNFANNSLAVELGSGLHFPPGQNQVSLYPGDGIDIR -292
          :  . .:        :  . . .  :
Ad2     - MEDPIYVN---------NGKIGIKISGPLQVAQ---------------- -215

BAV3    - DNRVTVPAGPGLRMLNHQLAVASGDGLEVHSDTLRLKLSHGLTFENGAVR -342
                                    :::: .    :.: :. ..:
Ad2     - ----------------------------NSDTLTVVTGPGVTVEQNSLR -236
```

FIG. 8C-1

```
BAV3    - AKLGPGLGTDDSGRSVVRTGRGLRVANGQVQIFSGRGTAIGTDSSLTLNI -392
          .:.   .: : :    .:: :.:. :     .          . . : : .
Ad2     - TKVAGAIGYDSSNNMEIKTGGGMRINNNL--LILDVDYPFDAQTKLRLKL -284

BAV3    - RAPLQFSGPALTASLQGSGPITYNSNNGTFGLSIGPGMWVDQNRLQVNPG -442
                      : :::.  :.          :  .:
Ad2     - ----------------GQGPLYINASHN----------------LDINYN -302

BAV3    - AGLVFQGNNLVPNLADPLAISDSKISLSLGPGLTQASNALTLSLGNGLEF -492
            ::                :  .  :   .  .:          :: :
Ad2     - RGLYL--------------FNASNNTKKLEVSIKKSS---------GLNF -329

BAV3    - SNQAVAIKAGRGLRFESSSQALESSLTVGNGLTLTDTVIRPNLGDGLEVR -542
            : :.:: ::.:: :.. .
Ad2     - DNTAIAINAGKGLEFDTNT------------------------------- -348

BAV3    - DNKIIVKLGANLRFENGAVTAGTVNPSAPEAPPTLTAEPPLRASNSHLQL -592
Ad2     - ---------------------------------------------------- -348

BAV3    - SLSEGLVVHNNALALQLGDGMEVNQHGLTLRVGSGLQMRDGILTVTPSGT -642
                          .  ..:   .  .:::.           :.
Ad2     - ----------------SESPDIN--PIKTKIGSGID-------YNENGA -372

BAV3    - PIEPRLTAPLTQTENGIGLALGAGLELDESALQVKVGPGMRLNPVEKYVT -692
            :             :::::  : :
Ad2     - MIT---------------KLGAGLSFDNSG------------------- -387
```

FIG. 8C-2

```
BAV3    - LLLGPGLSFGQPANRTNYDVRVSVEPPMVFGQRGQLTFLVGHGLHIQNSK -742
            .. :       : ....                          : .
Ad2     - -----AITIG-----NKNDDKLTLWTTPDPSP---------------NCR -412

BAV3    - LQLNLGQGLRTDPVTNQLEVPLGQGLEIADESQVRVKLGDGLQFDSQARI -792
          .                          .  .  :    ::
Ad2     - IHSD-----------------------NDCKFTLVLT---KCGSQVLA -434

BAV3    - TTAPNMVTETLWTGTGSNANVTWRGYTAPGSKLFLSLTRFSTGLVLGNMT -842
            : :   :.  : . ::. : :.          .::        :... : .
Ad2     - TVAALAVSGDLSSMTGTVASVS----------IFLRFDQ--NGVLMENSS -472

BAV3    - IDSNASFGQYINAGHEQIECFILLDNQGNLKEGSNLQGTWEVKNNPSASK -892
          .                          :  .  :          ::  .
Ad2     - LKKHY--------------------WNFRNGNS------TNANPYTNA -494

BAV3    - AAFLPSTALYPILNESRGSLPGKNLVGMQAILGGGGTCTVIA-TLNGRRS -941
            :.:    ::    .      :.:    .  :     ...  ::::
Ad2     - VGFMPNLLAYP---KTQSQTAKNNIVSQVYLHGDKTKPMILTITLNGTSE -541

BAV3    - NNYPAGQSII---FVWQ-EFNTIARQPLNHSTLTFSYWT -976
            .  :     : :  :    .     . ::::  .
Ad2     - STETSEVSTYSMSFTWSWESGKYTTETFATNSYTFSYIAQE -582
```

FIG. 8C-3

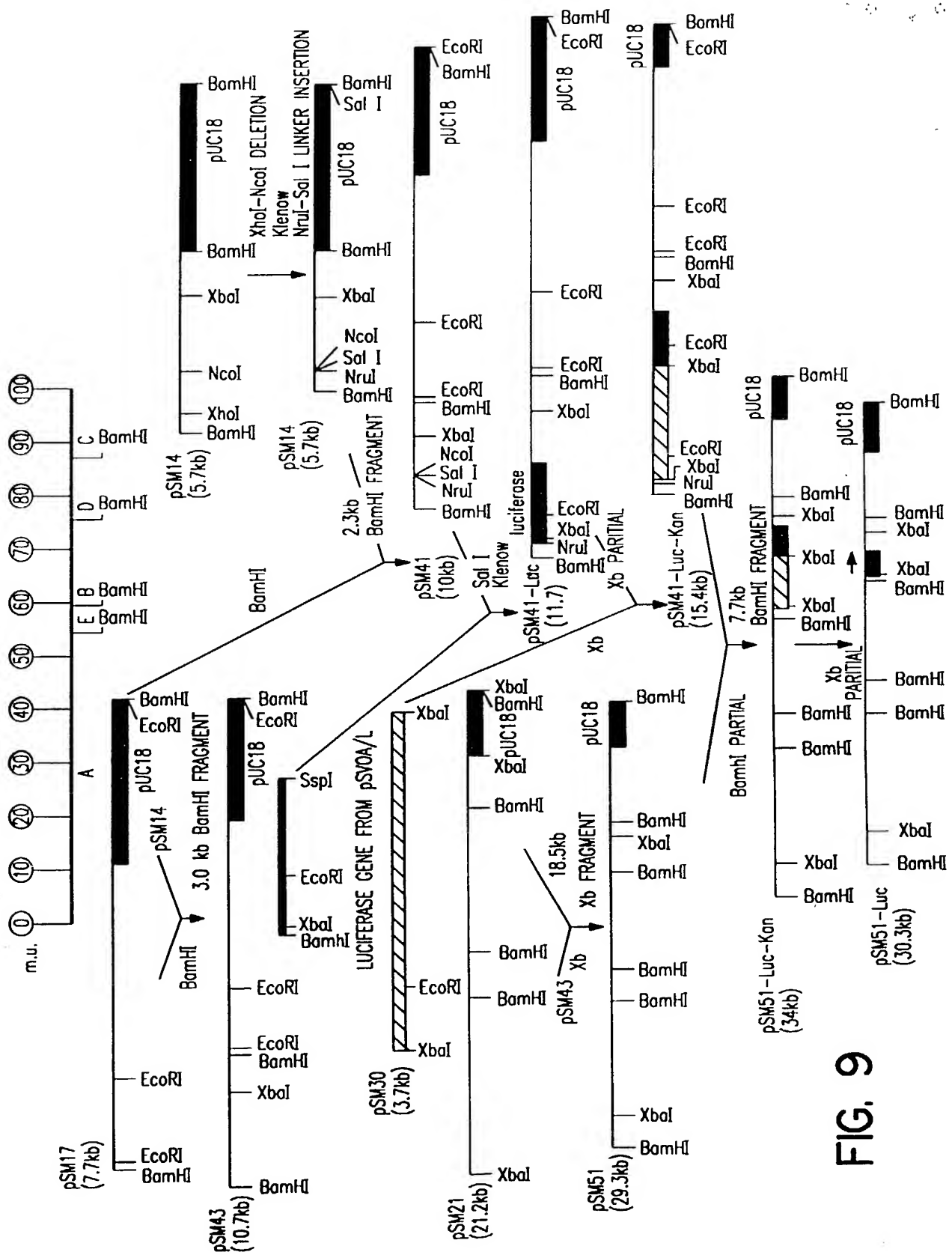
m.u.
0
10
20
30
40
50
60
70
80
90
100
A
B BamHI
E BamHI
D BamHI
C BamHI
pSM17 (7.7kb)
BamHI
EcoRI
pUC18
pSM14
3.0 kb BamHI FRAGMENT
EcoRI
BamHI
pSM43 (10.7kb)
pUC18
SspI
EcoRI
XbaI
BamHI
LUCIFERASE GENE FROM pSV0A/L
pSM30 (3.7kb)
pSM14 (5.7kb)
XhoI-NcoI DELETION
Klenow
NruI-SaI I LINKER INSERTION
NcoI
SaI I
NruI
2.3kb BamHI FRAGMENT
pSM41 (10kb)
SaI I
Klenow
luciferase
pSM41-Luc (11.7)
PARTIAL
pSM21 (21.2kb)
18.5kb
Xb FRAGMENT
pSM43
pSM51 (29.3kb)
pSM41-Luc-Kan (15.4kb)
7.7kb
BamHI FRAGMENT
BamHI PARTIAL
pSM51-Luc-Kan (34kb)
pSM51-Luc (30.3kb)

FIG. 9

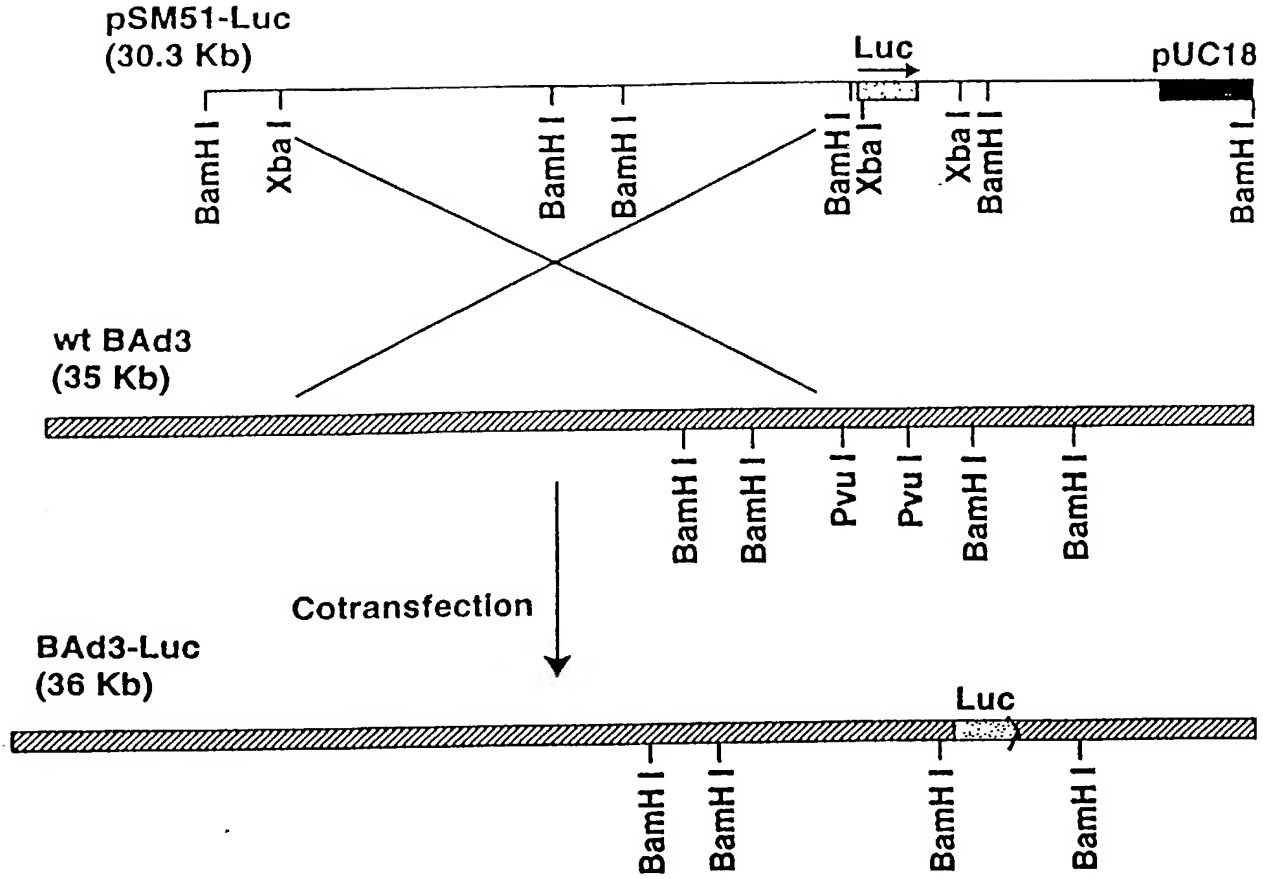
pSM51-Luc
(30.3 Kb)
Luc
pUC18
BamH I
Xba I
BamH I
BamH I
BamH I
Xba I
Xba I
BamH I
BamH I
wt BAd3
(35 Kb)
BamH I
BamH I
Pvu I
Pvu I
BamH I
BamH I
Cotransfection
BAd3-Luc
(36 Kb)
Luc
BamH I
BamH I
BamH I
BamH I

FIG. 10

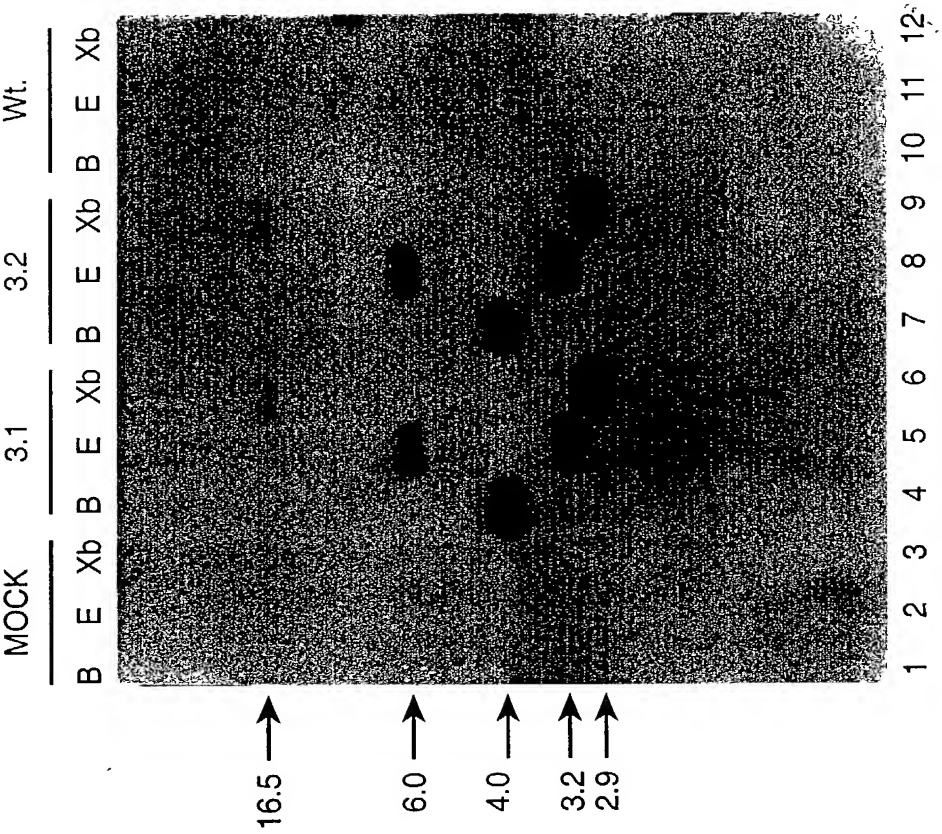

FIG. 11B

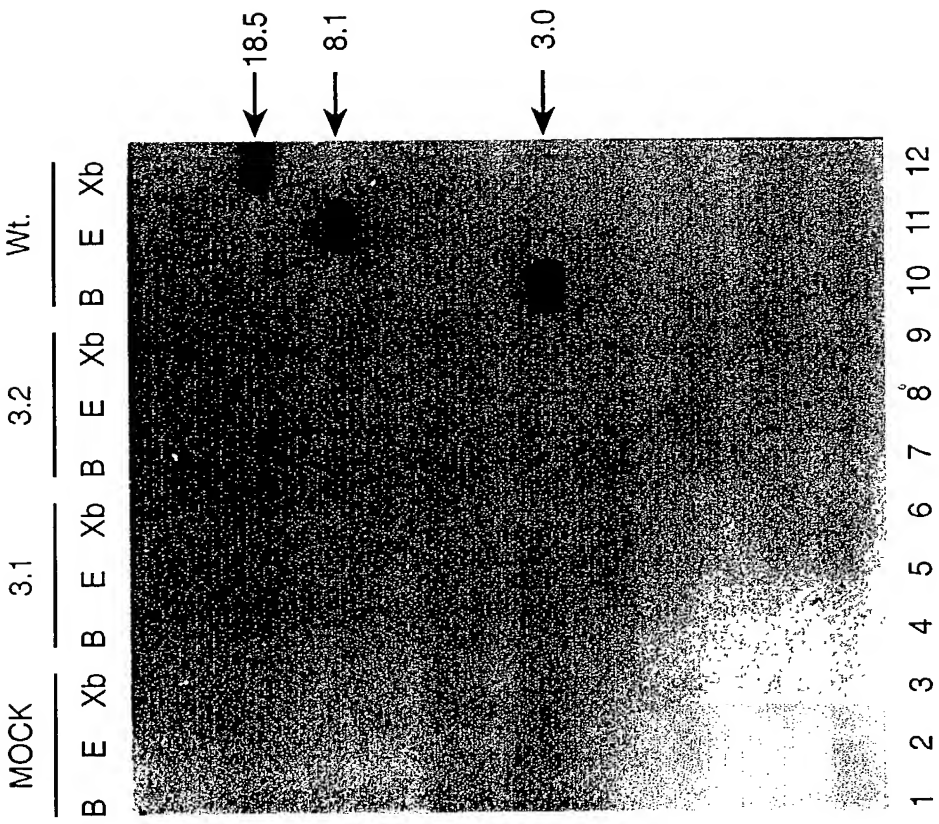

FIG. 11A

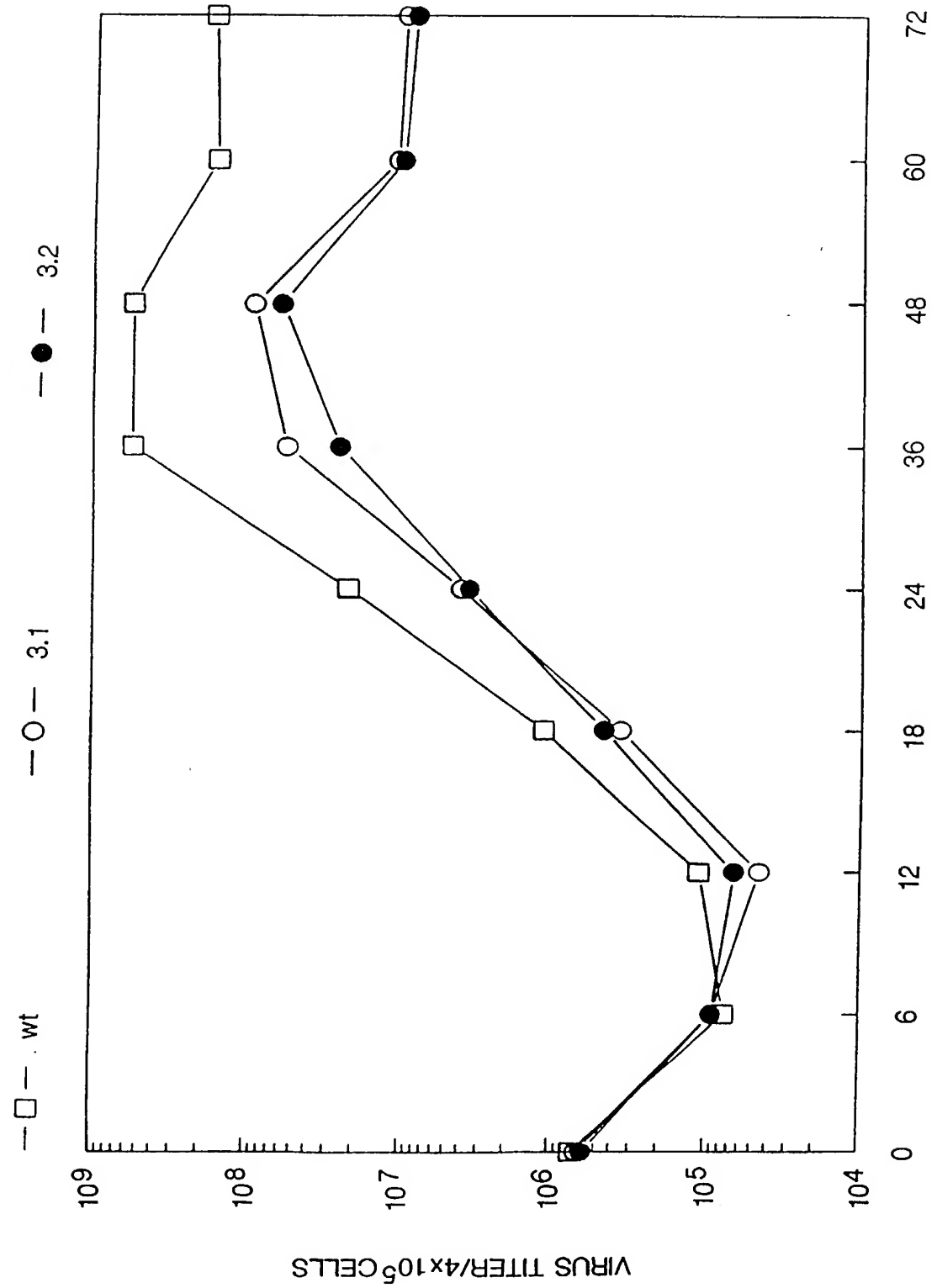
— □ — wt
— ○ — 3.1
— ● — 3.2
VIRUS TITER/4x10⁵ CELLS
10⁹
10⁸
10⁷
10⁶
10⁵
10⁴
0
6
12
18
24
36
48
60
72
HOURS POST-INFECTION

FIG. 12

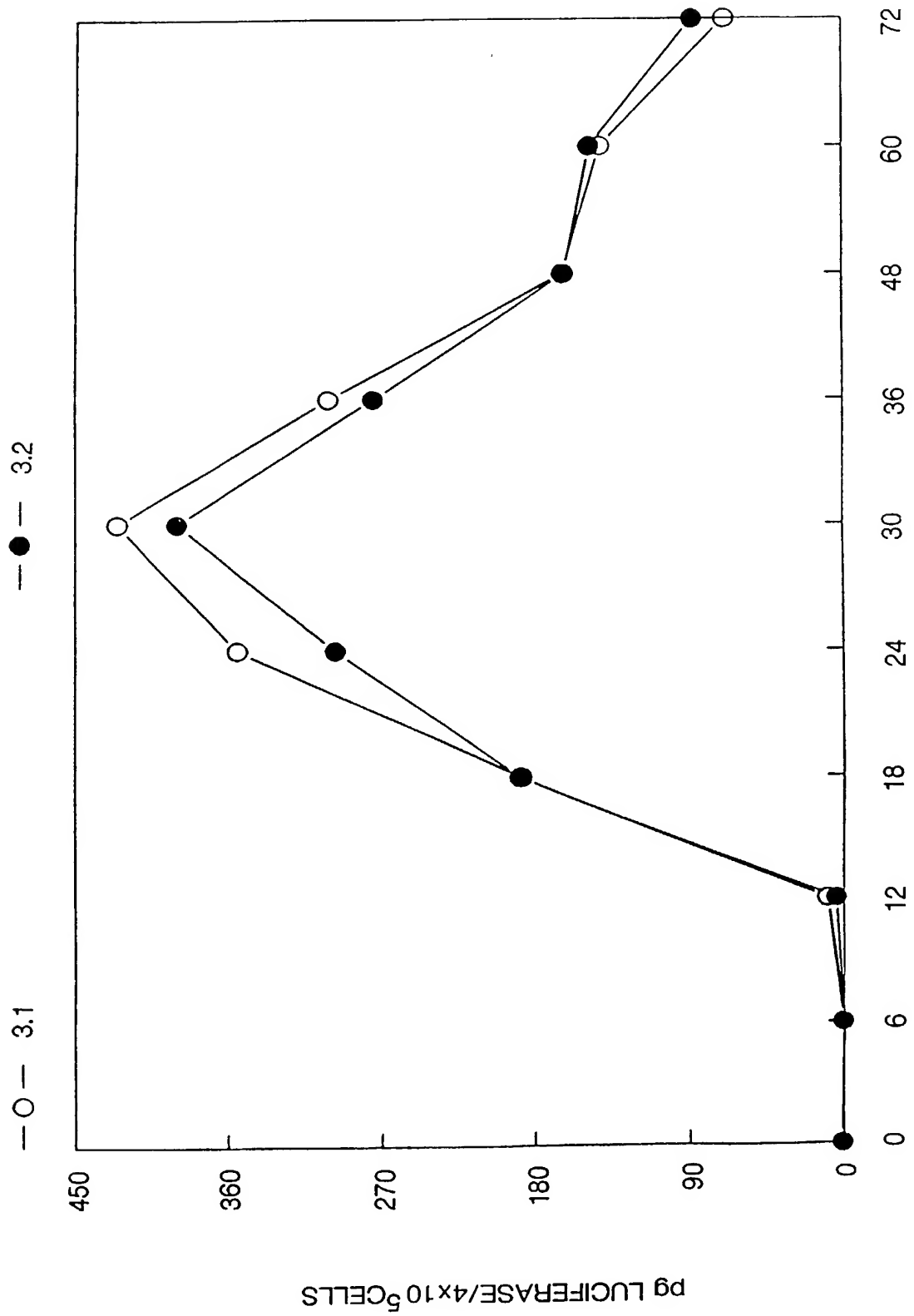
pg LUCIFERASE/4x10^5CELLS
450
360
270
180
90
0
0
6
12
18
24
30
36
48
60
72
HOURS POST-INFECTION
—O— 3.1
—●— 3.2

FIG. 13

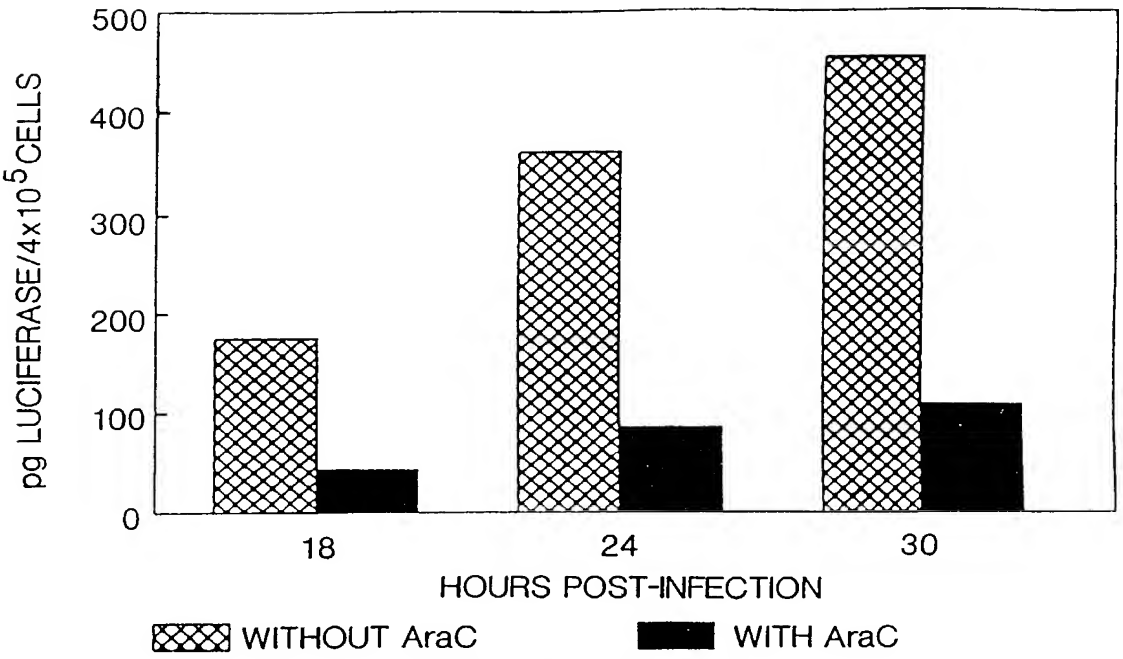

FIG. 14A

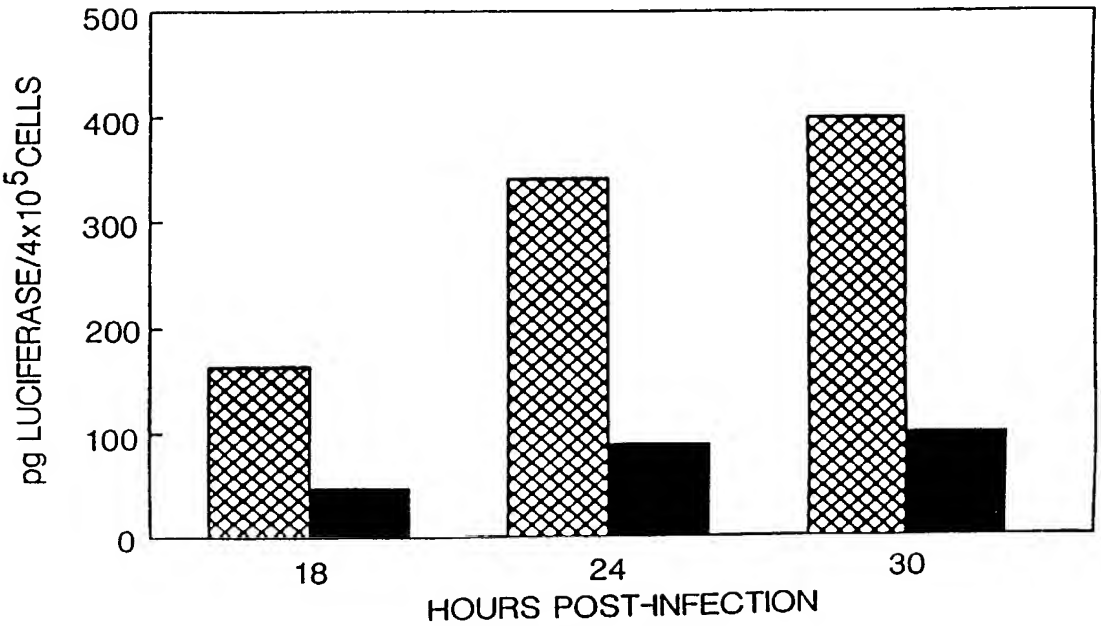

FIG. 14B

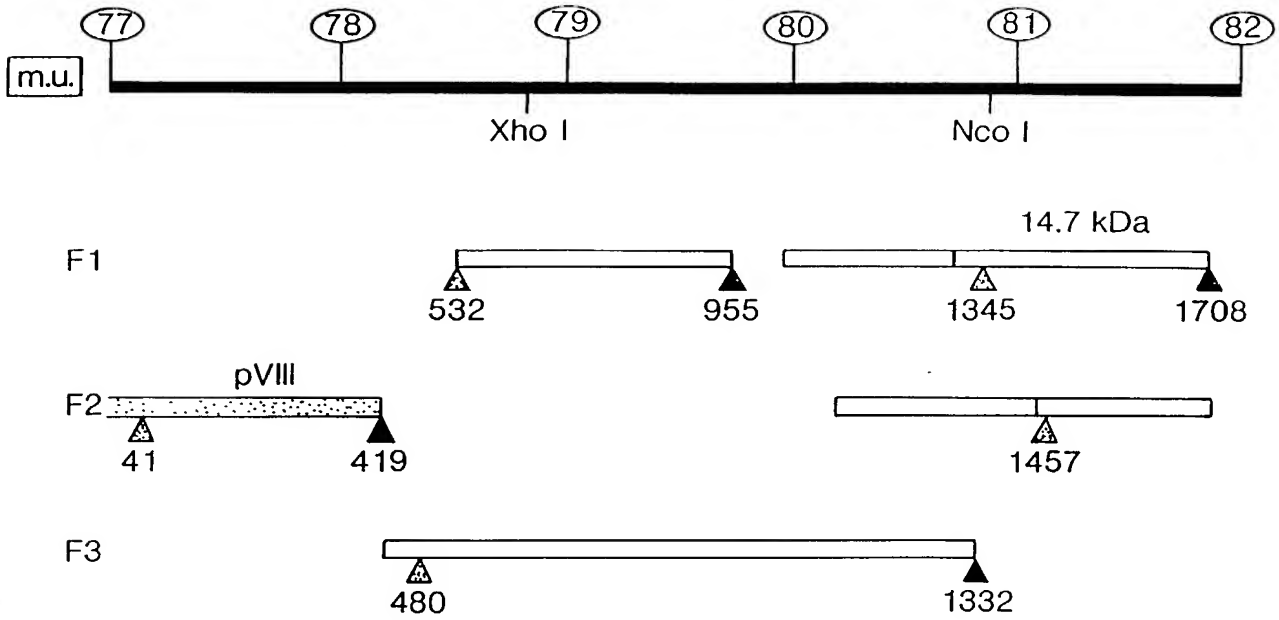

FIG. 15A

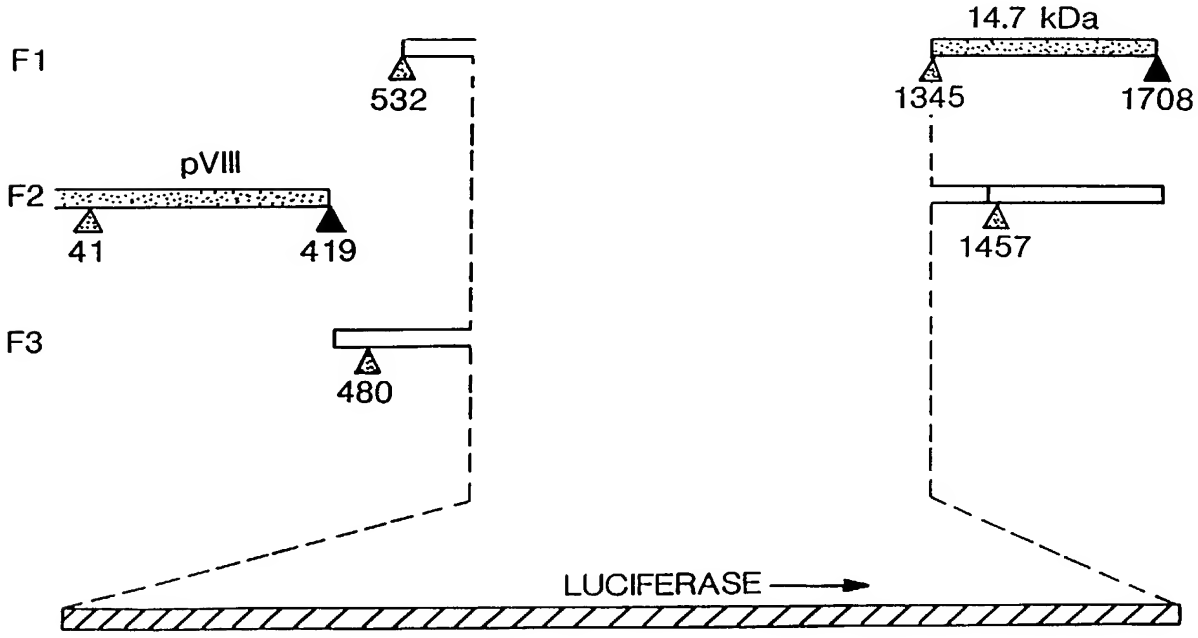

FIG. 15B

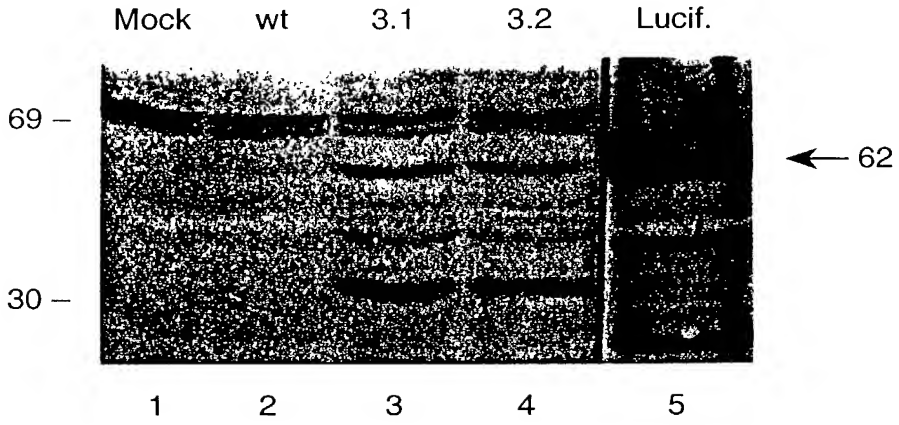

FIG._16

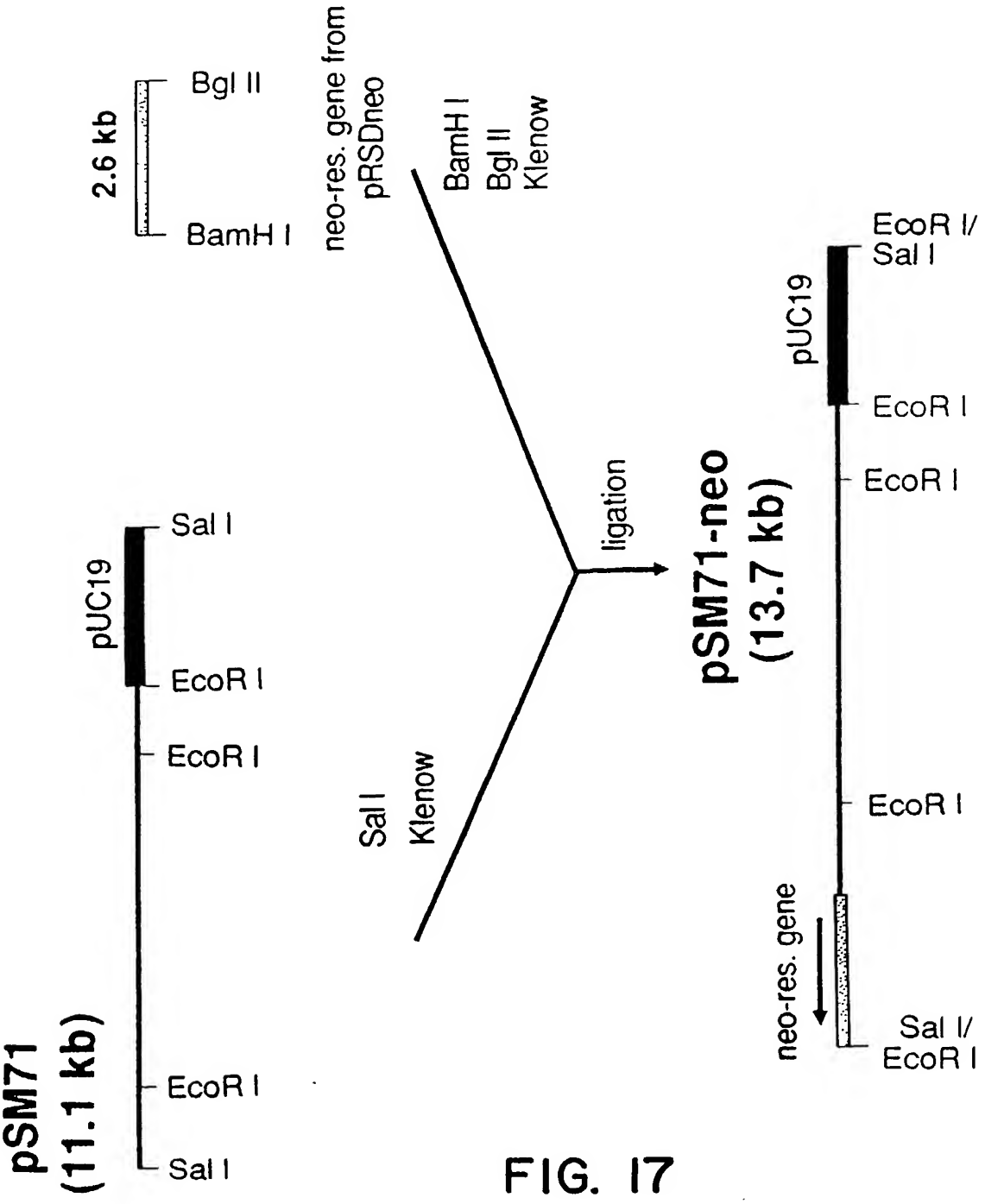
2.6 kb
Bgl II
BamH I
neo-res. gene from pRSDneo
BamH I
Bgl II
Klenow
Sal I
Klenow
ligation
pSM71 (11.1 kb)
pUC19
Sal I
EcoR I
EcoR I
EcoR I
Sal I
pSM71-neo (13.7 kb)
pUC19
EcoR I/ Sal I
EcoR I
EcoR I
EcoR I
neo-res. gene
Sal I/ EcoR I

FIG. 17

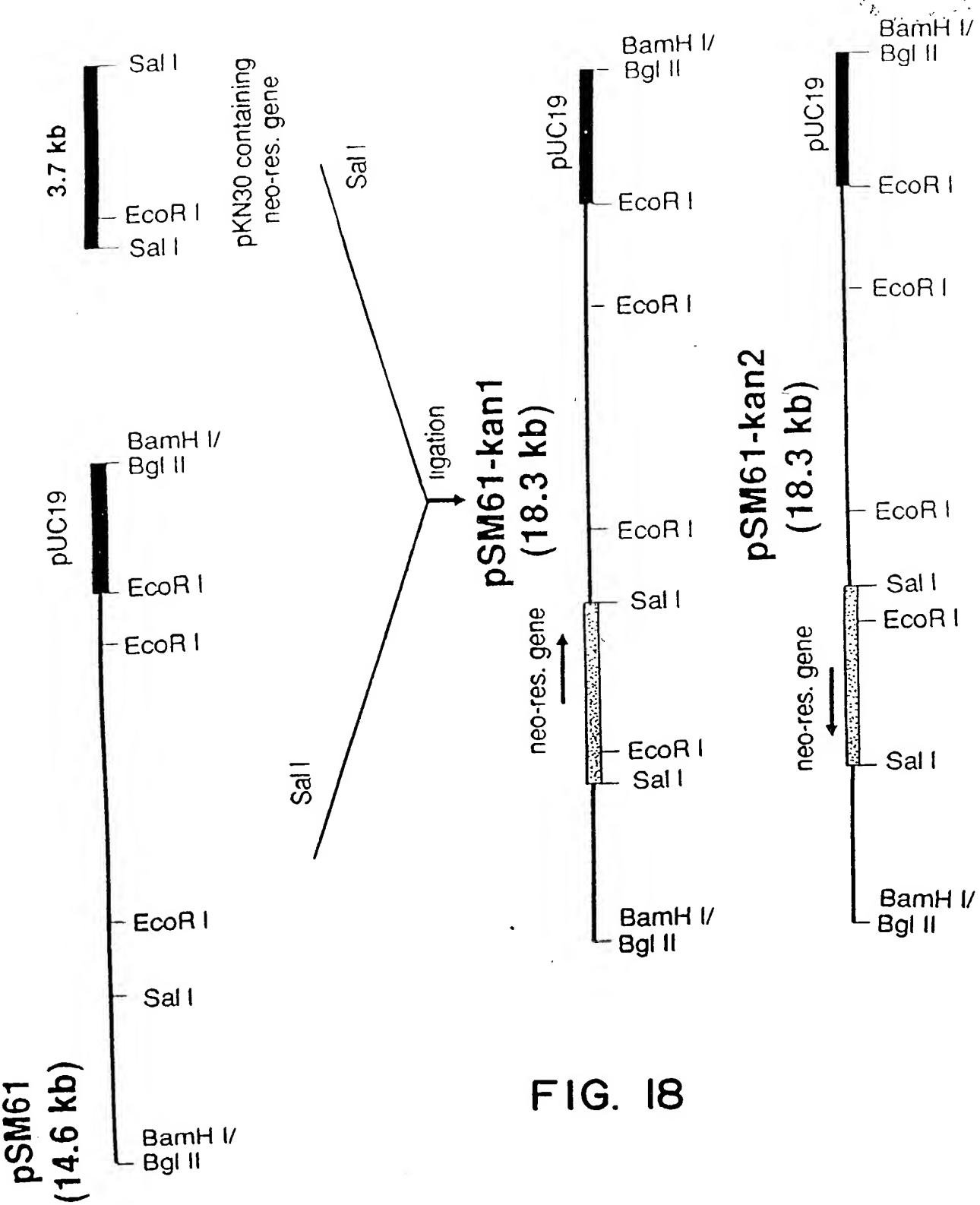
Sal I
3.7 kb
EcoR I
Sal I
pKN30 containing neo-res. gene
Sal I
Sal I
ligation
pUC19
BamH I/ Bgl II
EcoR I
EcoR I
EcoR I
EcoR I
Sal I
neo-res. gene
EcoR I
Sal I
BamH I/ Bgl II
pSM61-kan1 (18.3 kb)
pUC19
BamH I/ Bgl II
EcoR I
EcoR I
EcoR I
Sal I
EcoR I
neo-res. gene
Sal I
BamH I/ Bgl II
pSM61-kan2 (18.3 kb)
pSM61 (14.6 kb)
BamH I/ Bgl II
EcoR I
Sal I
EcoR I
EcoR I
pUC19
BamH I/ Bgl II

FIG. 18

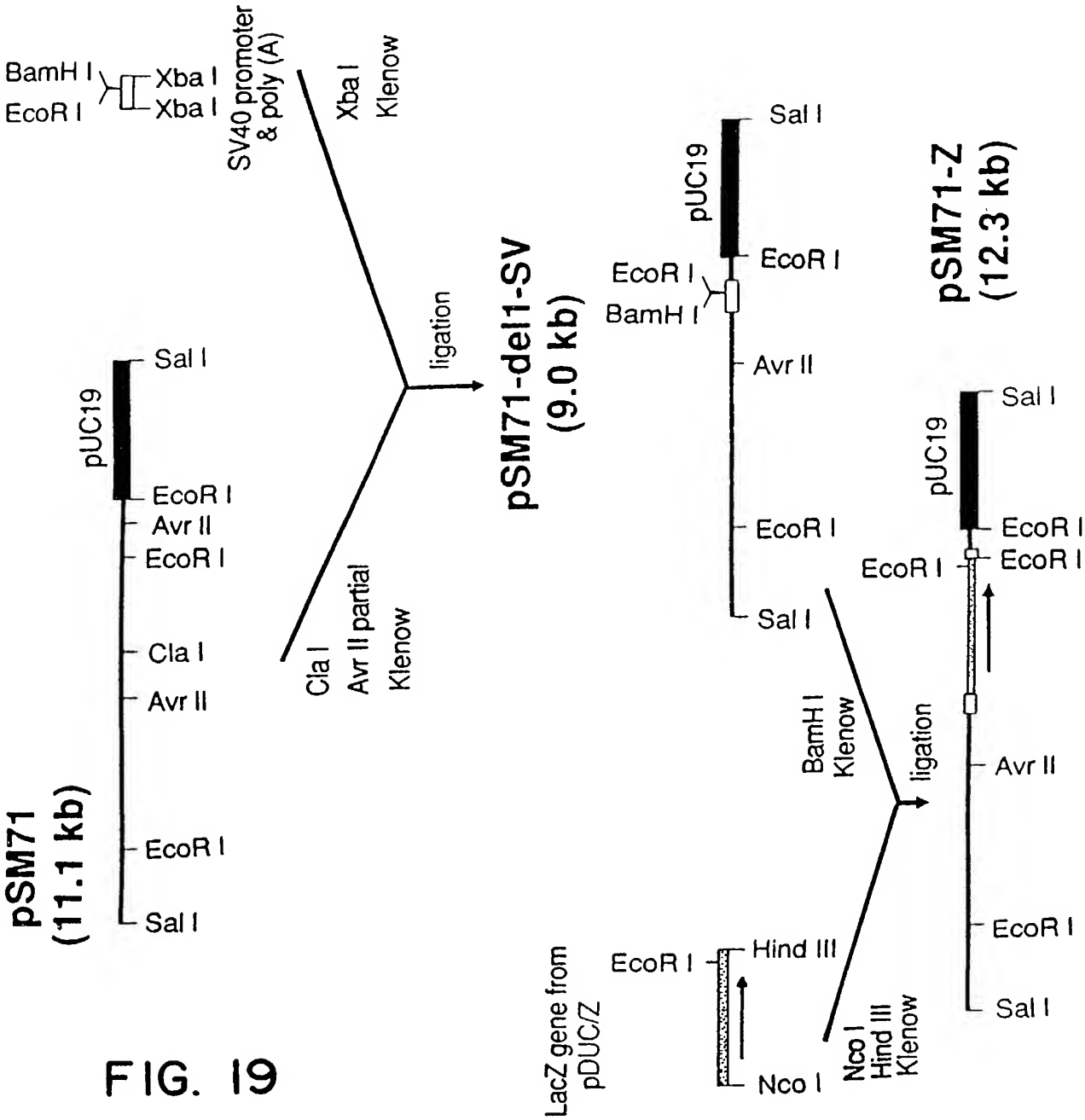
BamH I
EcoR I
Xba I
Xba I
SV40 promoter & poly (A)
Xba I
Klenow
ligation
pSM71-del1-SV (9.0 kb)
Cla I
Avr II partial
Klenow
pSM71 (11.1 kb)
pUC19
Sal I
EcoR I
Avr II
EcoR I
Cla I
Avr II
EcoR I
Sal I
pUC19
Sal I
EcoR I
EcoR I
BamH I
Avr II
EcoR I
Sal I
pSM71-Z (12.3 kb)
pUC19
Sal I
EcoR I
EcoR I
Avr II
EcoR I
Sal I
BamH I
Klenow
ligation
LacZ gene from pDUC/Z
EcoR I
Hind III
Nco I
Nco I
Hind III
Klenow

FIG. 19